RICE UNIVERSITY

The Next Step:
Recreational Trail Interface

by

Katherine Hays

A THESIS SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE

Master of Architecture

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Associate Professor

HOUSTON, TEXAS
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Abstract

The Next Step | Recreational Trail Interface

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The Next Step re-choreographs the trail system, encouraging a multiplicity of experiences while treating the city as an exhibit. This project focuses on the network's deployment in Washington, D.C. This network, empowered by digital navigational devices and blogging/chatting capabilities, forces a new dialogue between the organizational systems of recreational spaces and cities. The recreational corridor and its context are defined by perceived gradients and contrasts - determined by sensory information [sound, smell, light, temperature]. The expanded palette encourages a more dynamic and responsive network. Intersections, or nodes, whose scale and permanence has a direct relationship to the sensory contrast associated with their paths [magnitude of choice] are designed using a catalogue of programmatic-sensory specific elements that relate to the context of the paths and the definition of the node. These elements, deployed, enhance and amplify the site of the node to create a matrix of sensory atmospheres.

Acknowledgements

This thesis is an extension of many interests, explorations, and influences: accordingly, there are many different people to thank for many different things.

I would like to thank my advisor, Nonya Grenader, for always understanding what my project could or should be and for helping me to love my project again when I waivered.

I would like to thank Eva Franch for encouraging us all to dream big and for challenging me to clarify the terms of my arguments and push the most revolutionary of my ideas.

I would like to thank Albert Pope whose suggestions and readings helped me develop the foundation of my thesis.

I would like to thank all the faculty, staff, and students at Rice for wonderful environment: particularly Sean Lally and Clover Lee whose studios forced me to grow in my abilities to represent complex ideas.

I would like to thank the trustees of the John T. Mitchell Traveling Fellowship, this award allowed me to investigate the possibilities of my thesis in Washington, D.C. and Denver. Because much of my thesis is about bodily experience visiting the site was invaluable.

I would like to thank all the professors and my peers from Georgia Tech, particularly Frederick Pearsall who taught me to translate philosophical ideas into beautiful design.

I want to thank my family who have always indulged and supported all my 'projects:' To my dad for a childhood of hiking and camping, my sister, Sarah for coming with me to Denver , and my mother whose support for our AT hike ranged from diligently mailing supply packages to driving in the rain to the top of a north Georgia mountain in a packed full rented minivan to drop us off at the start of the trail.

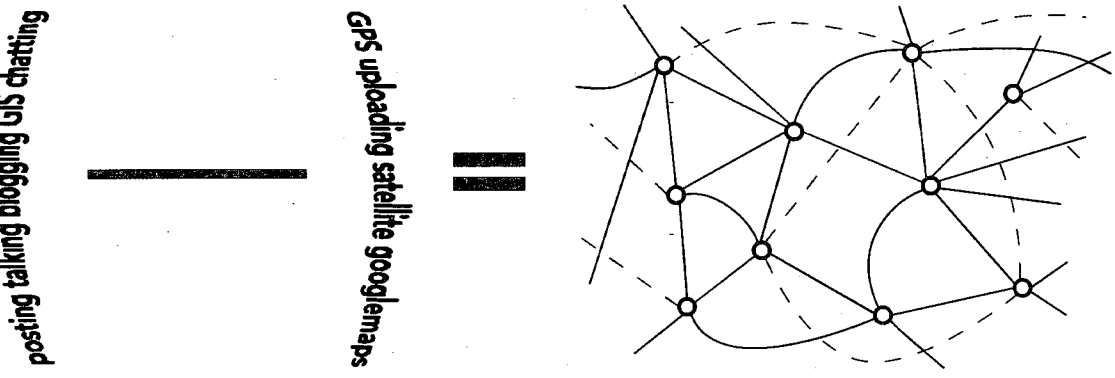
It's hard to imagine any of this without Randy, my husband, hiking partner, and best friend who has suffered through the last six and a half years of architecture school alongside me. He has been there to listen to my frustration or exuberance with a project, wake me up (no easy task), and show up with food at 1:30 in the morning during charrette. Also, for spurring me to hike the Appalachian Trail with him, which served as the inspiration for this thesis. 2,174 miles later we are still a team.

Contents

Context

Introduction: Recreational Corridor to Adaptable Network

Sited in the context of recreational spaces, *the Next Step* is about re-choreographing the trail system in order to encourage a multiplicity of experiences. Empowered by digital navigational devices and blogging/chatting capabilities, the city is treated as an exhibit with the linear prescribed path being transformed to allow for choice and preference.



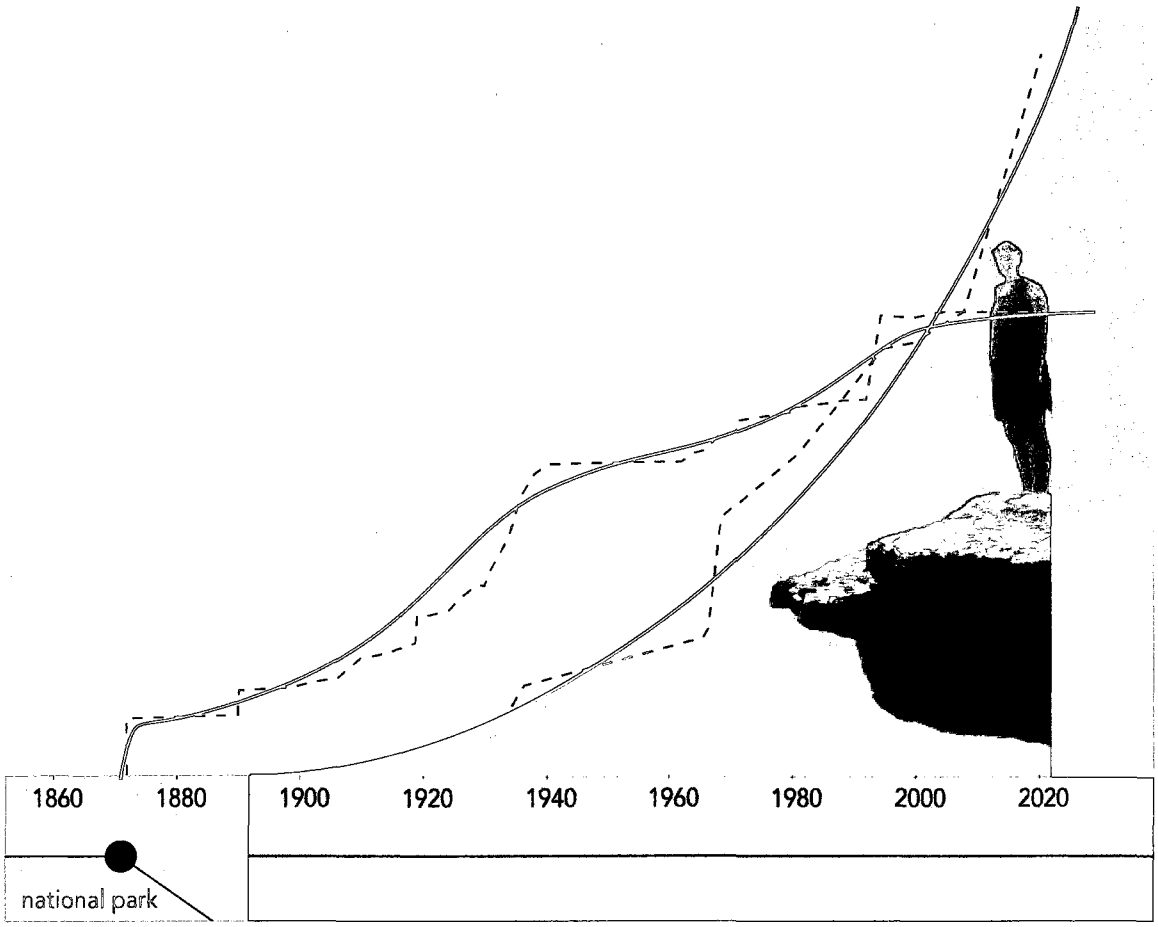
Relationship between Spaces

The proposed network forces a new dialogue between the organizational systems of recreational spaces and cities. I am interested in the dialectical relationships between trails and cities and the issues of the individual contrasted against the community. Below, you can see how the typologies of national parks and long distance trails (ex. Appalachian Trail) are related to one another. The new system seeks to collapse and question these relationships while not dichotomizing between 'good' and 'bad.'

The sublime vs. civilization | The sublime aspect of wilderness involves everything from the terror felt by early travelers in the mountains to the romanticism of Thoreau. The attraction of the sublime in America seems to lead us to divide our world into two categories. The first category includes national parks and extraordinary places where we can go, like pilgrims, to recreate physically while regenerating our community and environmental values. The second category consists of the places where we live, work, and shop. We lose the connection between the "nature" of these uncommon places and the "nature" of the ordinary worlds where we spend our lives.

Parks and/or Trails

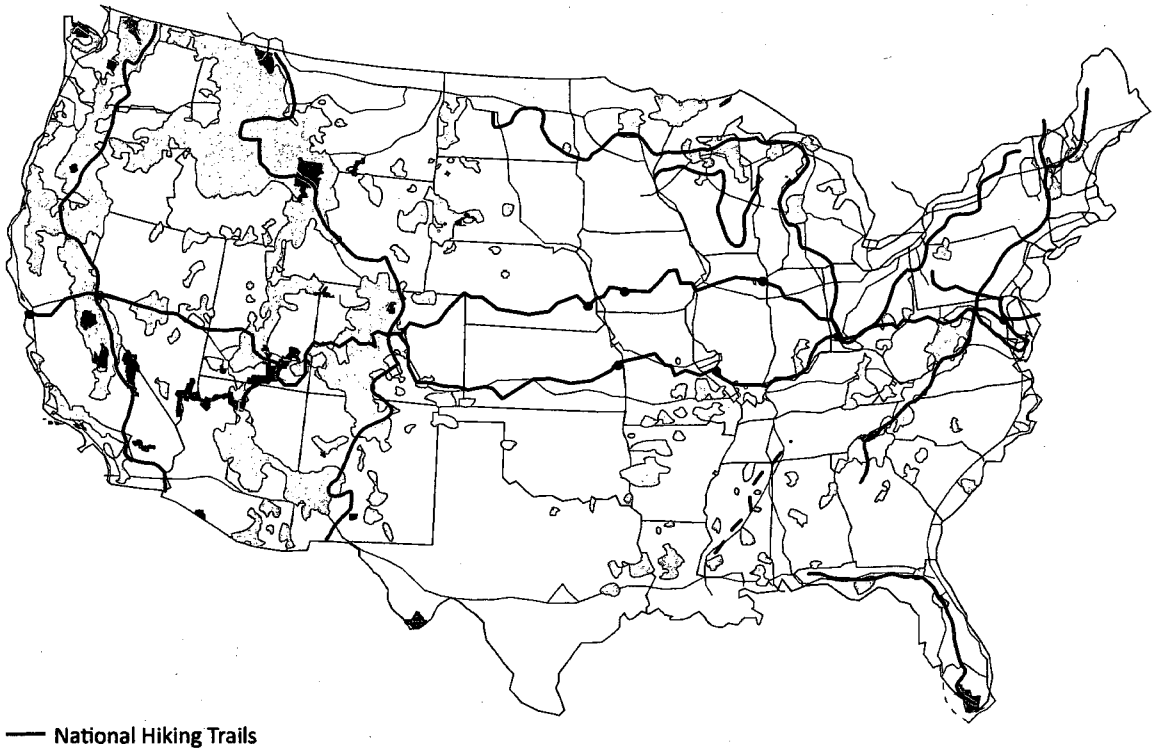
This proposal acknowledges emerging trends in outdoor recreational spaces and looks to anticipate future needs and desires. Development of national parks has essentially plateaued, whereas trail construction has been continuing at an escalating pace with many new trails planned between now and 2020. Several of these developing and planned trails are of the multi-use (accommodating cyclists for example), multi-terrain variety. For a more detailed analysis of parks and trails and a comparison of the patch and corridor models please see appendix pages 38-45.



Realizing the Current Network

Below is a map of the current network of recreational spaces. Large patches of remote land is protected as National Parks, Forests, and Grasslands. Of the hiking trails, the older trails all run North-South (AT, CDT, PCT) while more recently East-West trails have been developed, forming more of a network. The development of multi-use trails has made it easier to tie into other networks such as cycling routes, and trails have also begun recently to intentionally engage with cities. While everything shown on this map currently exists, the implication that it could be used as a network in a way similar to the interstate system is deceiving. While that is the direction things seem to be going it's really not there yet.

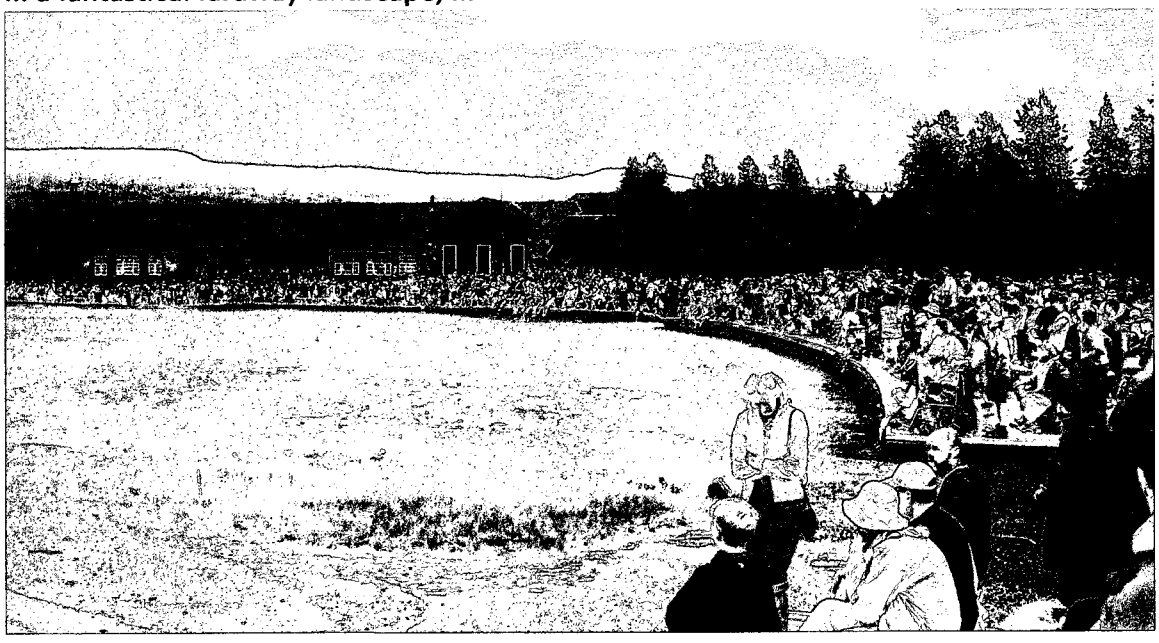
The new network values connectivity and variety; ...



* popular and often used cross-country routes mapped by the Adventure Cycling Association

... it is not meant to be a secluded wilderness trail, ...

... a fantastical faraway landscape, ...

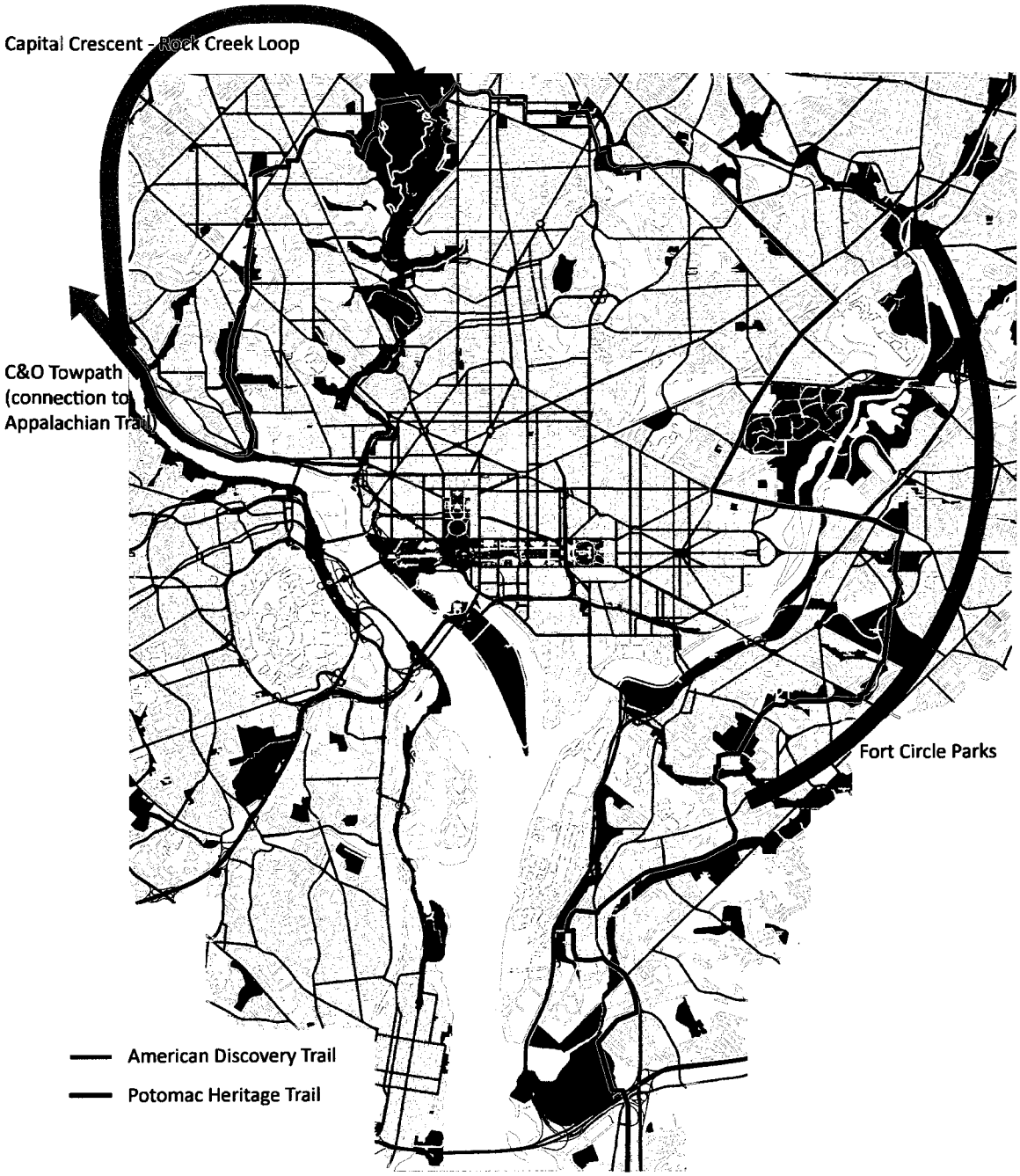


... or a journey through the city on the path of least resistance.

Washington, D.C.

Intersection City

This map shows how the **Potomac Heritage Trail** (mostly regional) **American Discovery Trail** (coast to coast) and the connection to **Appalachian Trail** (Georgia to Maine) converge in Washington, D.C.

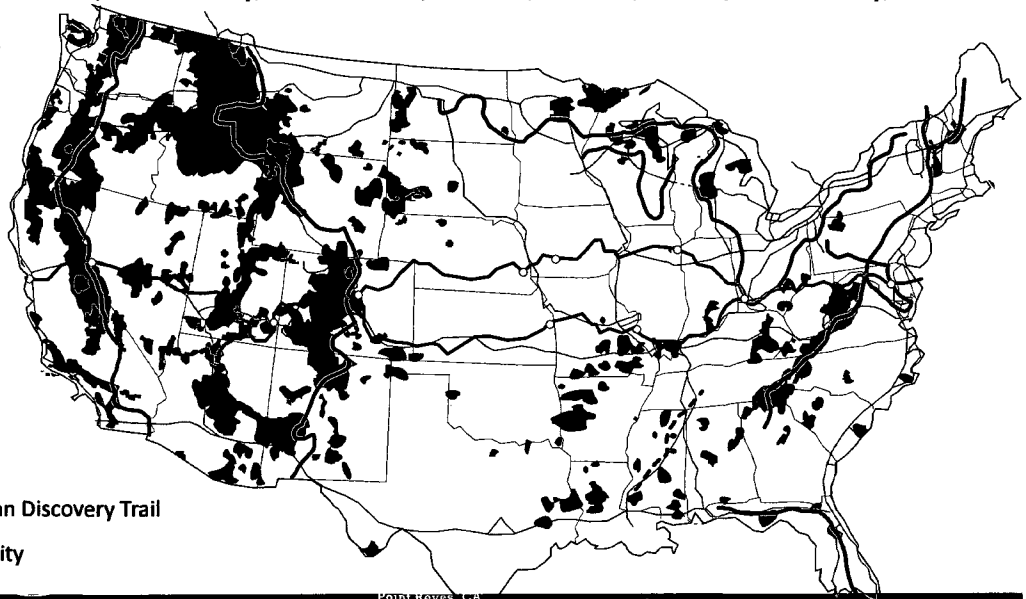


The American Discovery Trail and it's Aspirations

"Coast to Coast, and Connecting Everything in Between"

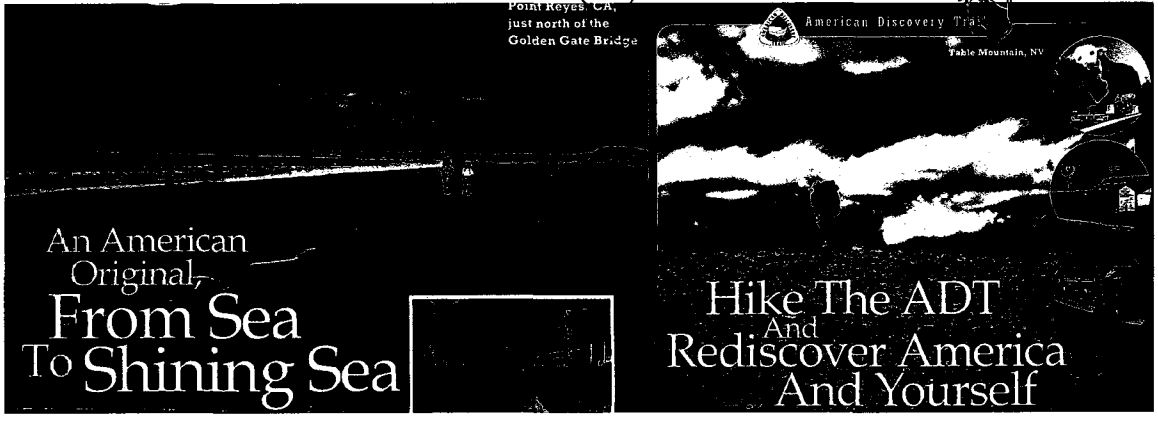
Opening: April 4, 2000
Mileage: 6, 356
Usage: Hiking, Biking, Horseback riding, Cross-country skiing, Snowshoeing

The ADT is intended to be a new breed of trail which passes through cities, small towns, forests, deserts, and mountains. It is promoted as being "a once-in-a-lifetime opportunity to journey into the heart of all that is uniquely American - our culture, heritage, landscape, and spirit." The ADT can be thought of as the backbone of the National Trail System, running from east to west, connecting 5 national scenic trails, 10 national historic trails, 25 national recreation trails, 14 national parks, and 16 national forests. It also connects metropolitan areas such as Washington, D.C., Cincinnati, Chicago, St. Louis, Kansas City, Des Moines, Lincoln, Denver, Moab, Carson City, and San Francisco.



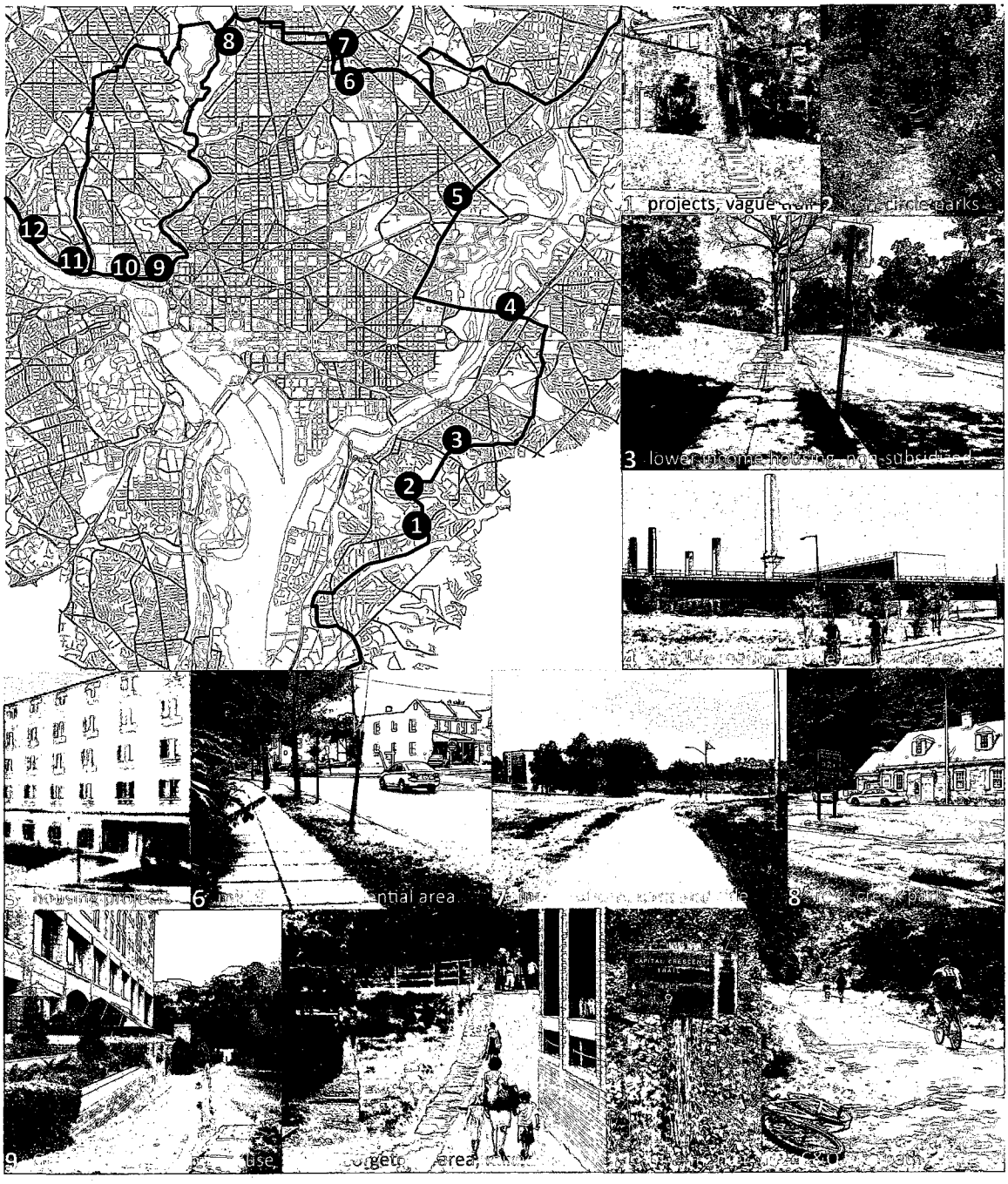
— American Discovery Trail

○ Major City



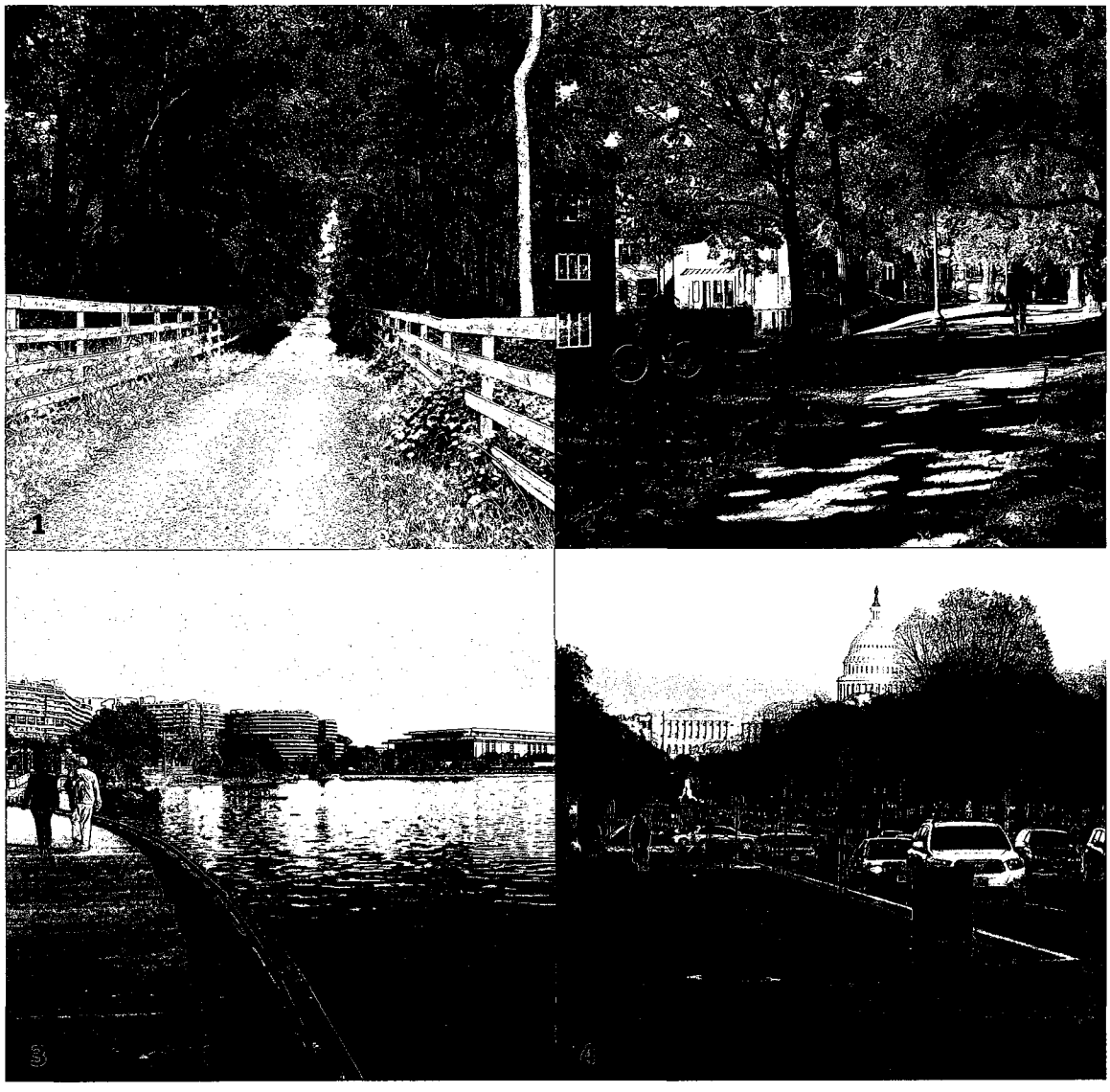
The DC Trail Experience

With large amounts of linearly organized green space, D.C. seems like it would easily accommodate trail networks. Unfortunately, exacerbated by lack of signage, the 'trail' often fades into the semi-urban fabric, losing its sense of route and direction. A vaguely defined trail is particularly problematic in some of the lower income housing neighborhoods of the southeast, an area not serviced by the metro trains.



Flaws of 'Path of Least Resistance'

Despite the goals of the ADT, the existing trails take an arc around the city, snapping to a ring of parks and failing to engage with D.C.'s tourist attractions and most of the pedestrian friendly neighborhoods and downtown areas. This route makes it difficult even to leave the path in order to go into and explore the city.



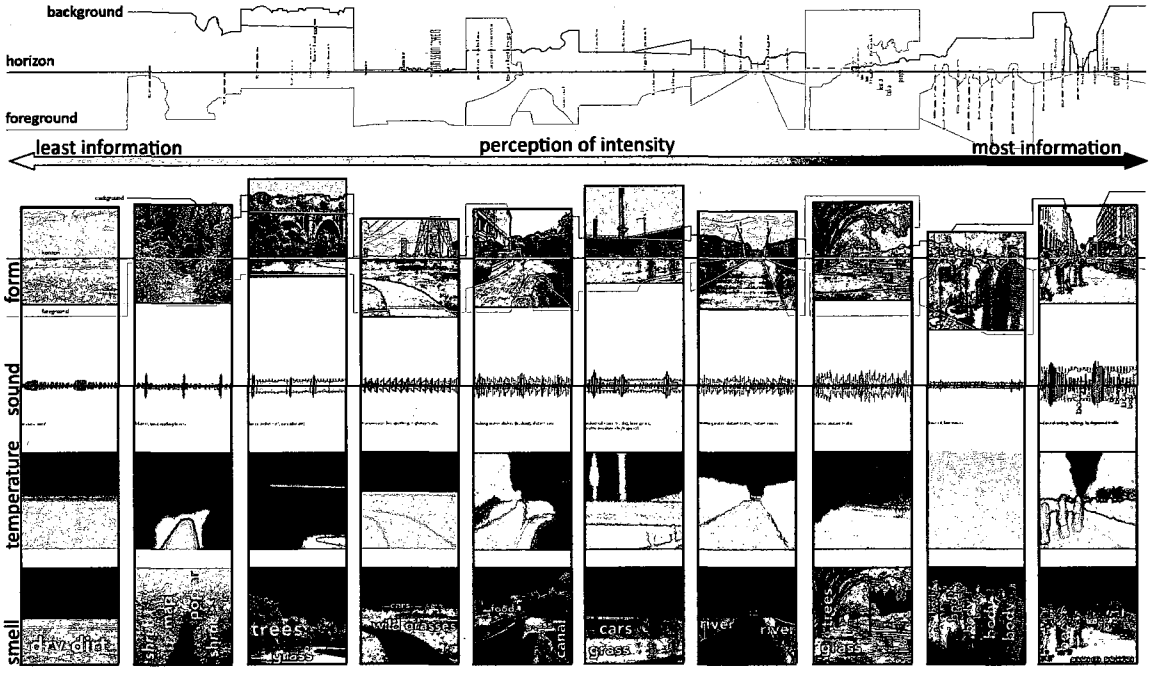
Areas Not Part of Existing Paths

1 Bicycle path through residential neighborhood
2 Neighborhood of Georgetown
3 Riverwalk on the Potomac near Rock Creek
4 Mall of Washington, D.C.

Re-choreographing Vocabulary

Experiential Information [Frame] - Perceptive Gradients

In order to free the trails from their default position I'm interested in mapping sensory *information in order to project a new valuation system for paths. I've defined ideas* of intensity [of information] formally by the play of the horizon and background and foreground lines – composed with other [visual] informational elements. These experiential frames are then exploded and other sensory information (smell, sound, temp) is described. The frames are ordered on the chart based on the perceived intensity of information.



Mapping Washington, D.C. - Step 1

The ideas about intensities of sensory information diagramed on the previous page were then used to map Washington, D.C. This layer is about visual/formal intensity.

park/recreational corridor

+

formal density

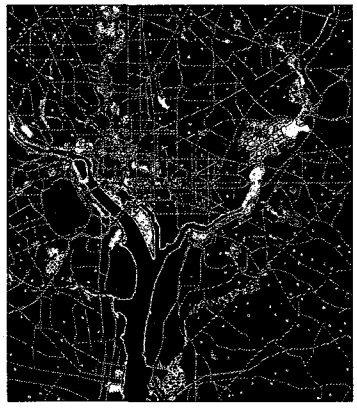
L [Light] visual information

Mapping Washington, D.C. - Step 2

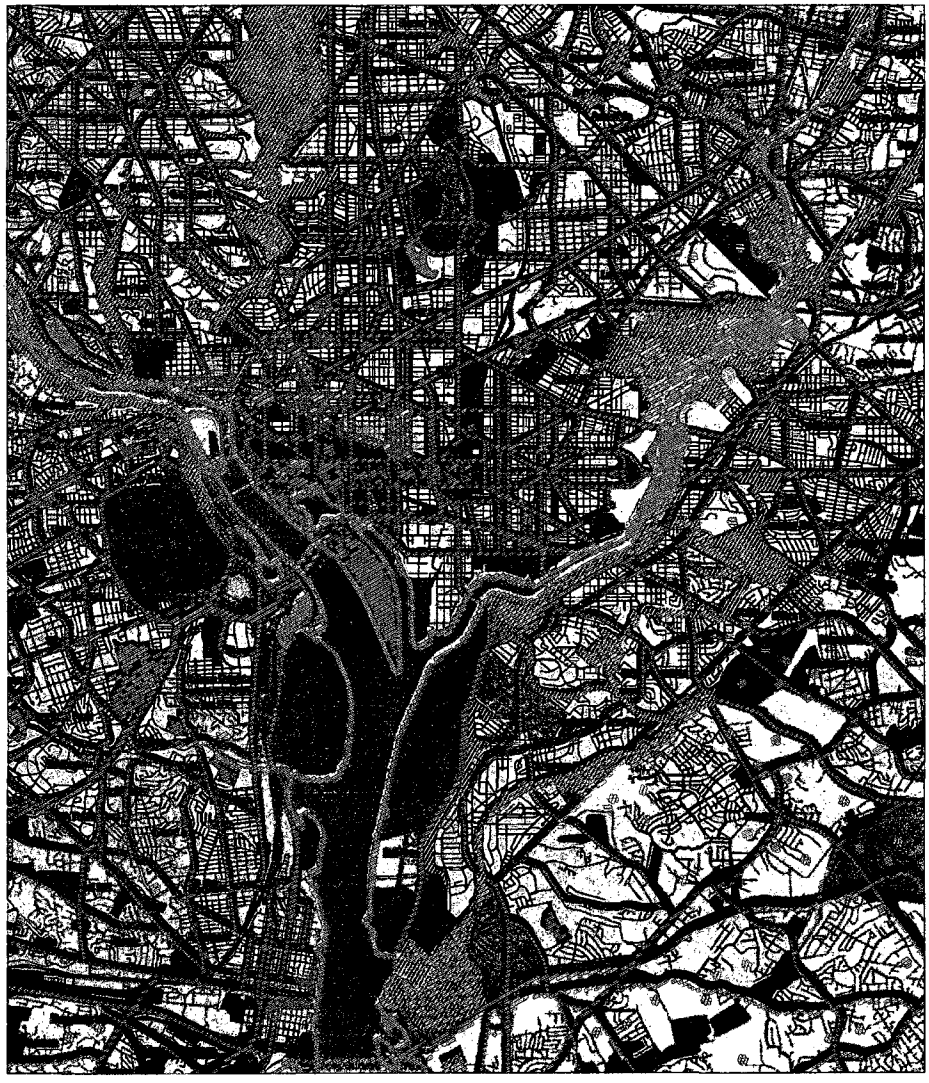
Expanding the palette of what defines recreational corridors encourages a more dynamic and responsive network. Each user can turn layers on and off to tailor their experience.

L

+



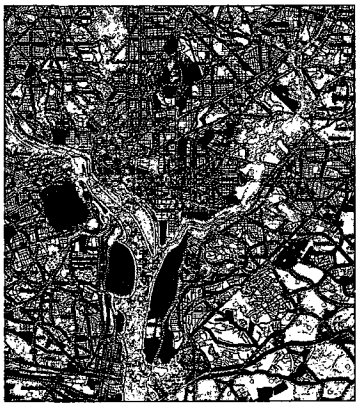
M [sMell]



ML

Mapping Washington, D.C. - Step 3

Empowered by digital navigational devices and blogging/chatting capabilities, the maps can be modified in real time as conditions change and users upload information.



ML

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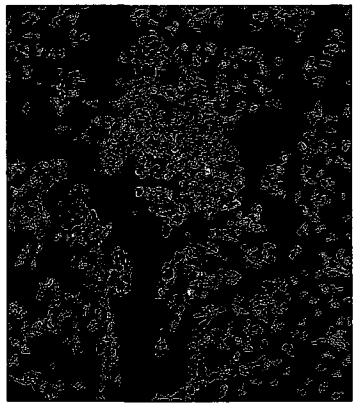
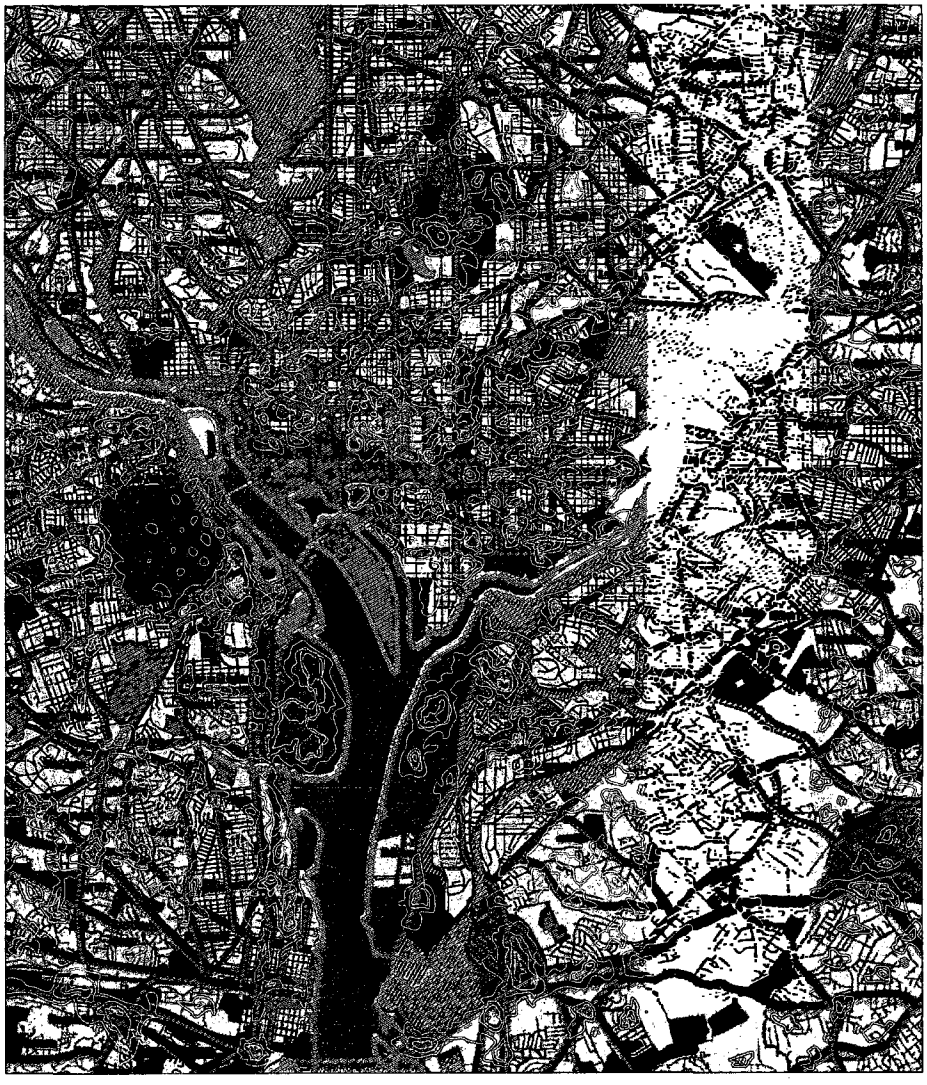


T [Temperature]



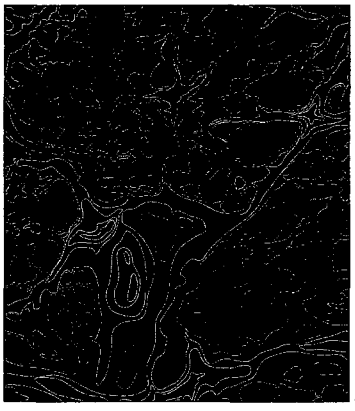
TML

Mapping Washington, D.C. - Step 4

The maps I have shown are just the beginning of what could be represented. Other information could involve textures, artificial light levels, plant species, etc.

TML

+



S [Sound]

STML

Mapping Washington, D.C. - Step 5

As people build a database of information, one could decide to follow the 'lavender scent' trail or the 'sounds of water' tour.

STML

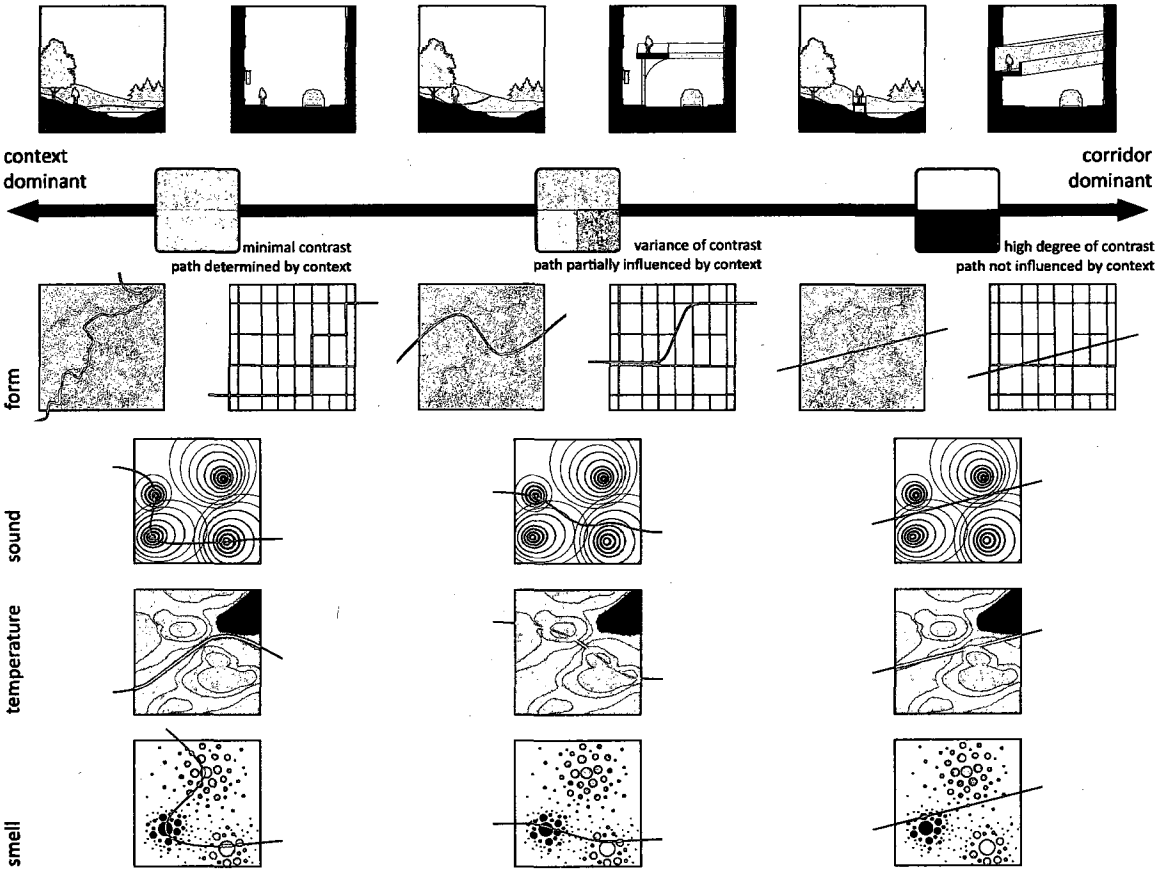
-

L

STM

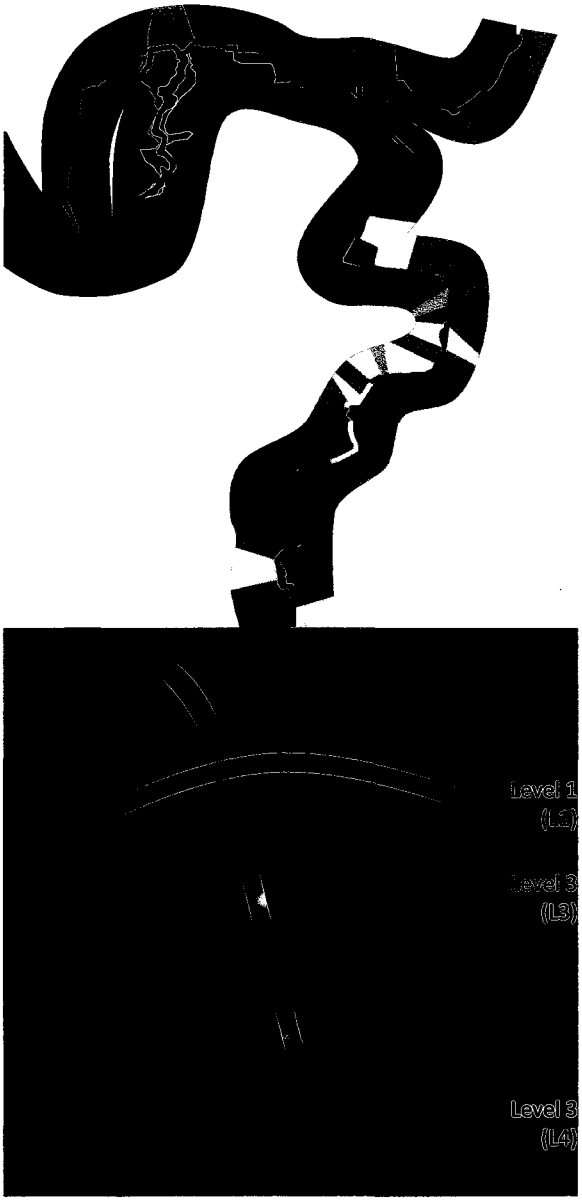
Experiential Information [Route] - Perceptive Contrasts

Perceptive contrasts come from the contrast [of information intensity] between the path and its context. In other words, how the path navigates a field [landscape, city grid, sound field, etc] has specific implications sectionally and determines whether the path or the context dominates the experience. Thus, the choice of route determines the intensity of contrast experienced.



Route Mapping

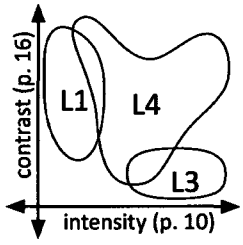
Using the same convention for representing intensity and contrast as in the axis of the previous graph, the trail experience can be mapped. This allows one to speculate about what characteristics should be available.



Intensity/Contrast Map of Existing DC Trails

The existing paths rarely experiences much contrast and has only gradually changing intensities.

Idealized City Routes Map

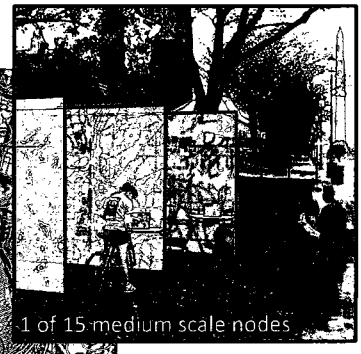


L1, Urban Nature Route
corridor dominant, high level of contrast, minimal acceleration and deceleration
L3, City Attractions Route
context dominant, low level of contrast, smooth gradient acceleration and deceleration
L4, Working City Route
alternating dominance, variety of contrast levels, quick acceleration and deceleration

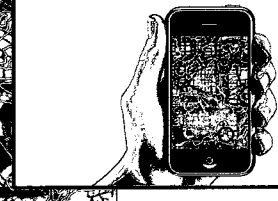
While this type of mapping is useful for clarifying intent and methodology, it would be impractical (and hypocritically constraining) to prescribe entire routes through the city. Instead, a system of nodes will be deployed allowing the routes between those nodes to be more temporal and adaptable. The route from node to node [recreational corridor] is defined and determined by perceptive time gradients and contrasts, which are determined by sensory - based information [sound, smell, light, temperature].

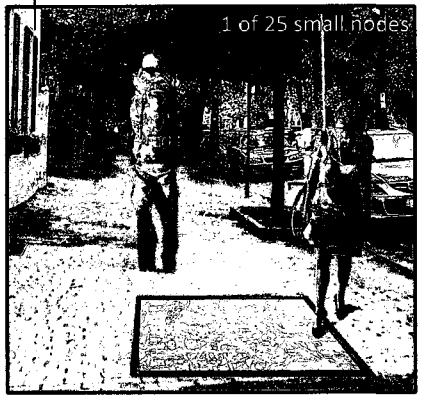
Node Design

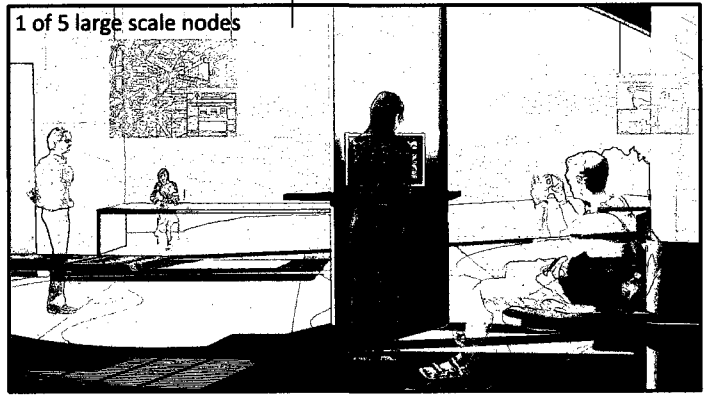
Deployment | The project's focus is on intersections, or nodes, whose scale and permanence have a direct relationship to the amount of sensory contrast associated with those paths [magnitude of choice].



use of digital navigational devices and real time editing capabilities



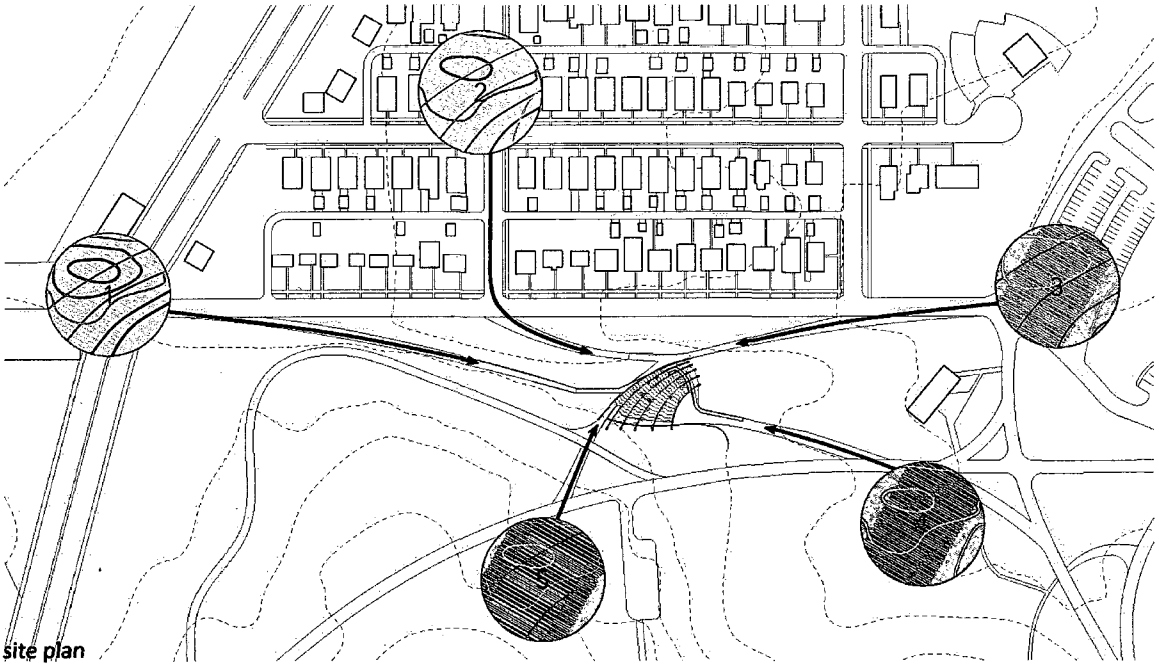




Site/Node of Focus

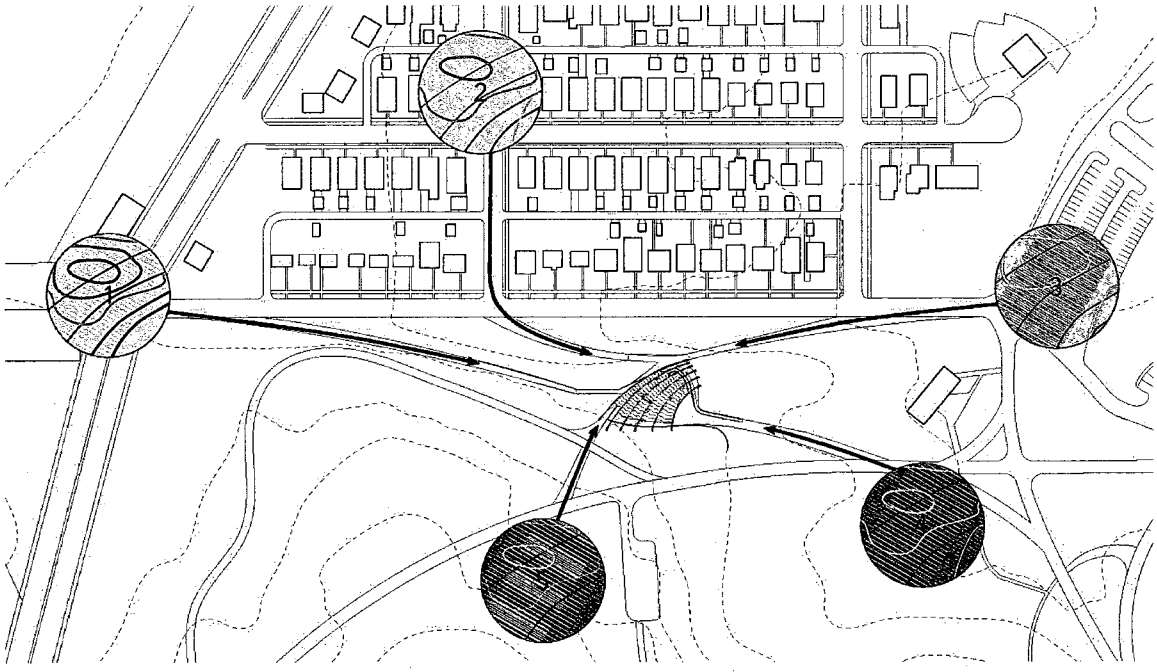
I've chosen to focus on one of the five nodes located in areas of highest contrast. Positioned just inside the 'loop' of recreational areas surrounding DC, this site is on the edge of the National Arboretum where it abuts a small scale, older residential neighborhood. Five routes leading to this node are identified and described.

The characteristics of each route and prevailing directions of the circulatory patterns are used to shape and structure the pavilion located at this node.

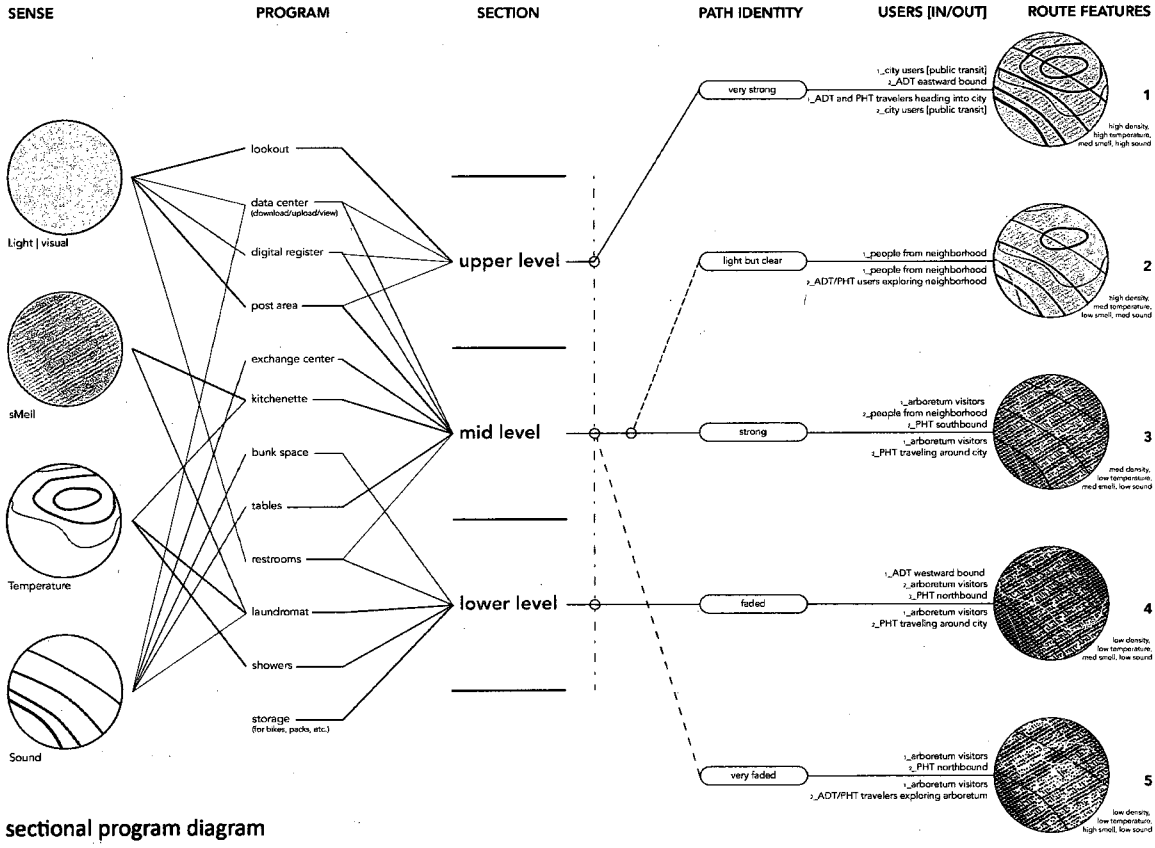


site plan

Sectional Node Design



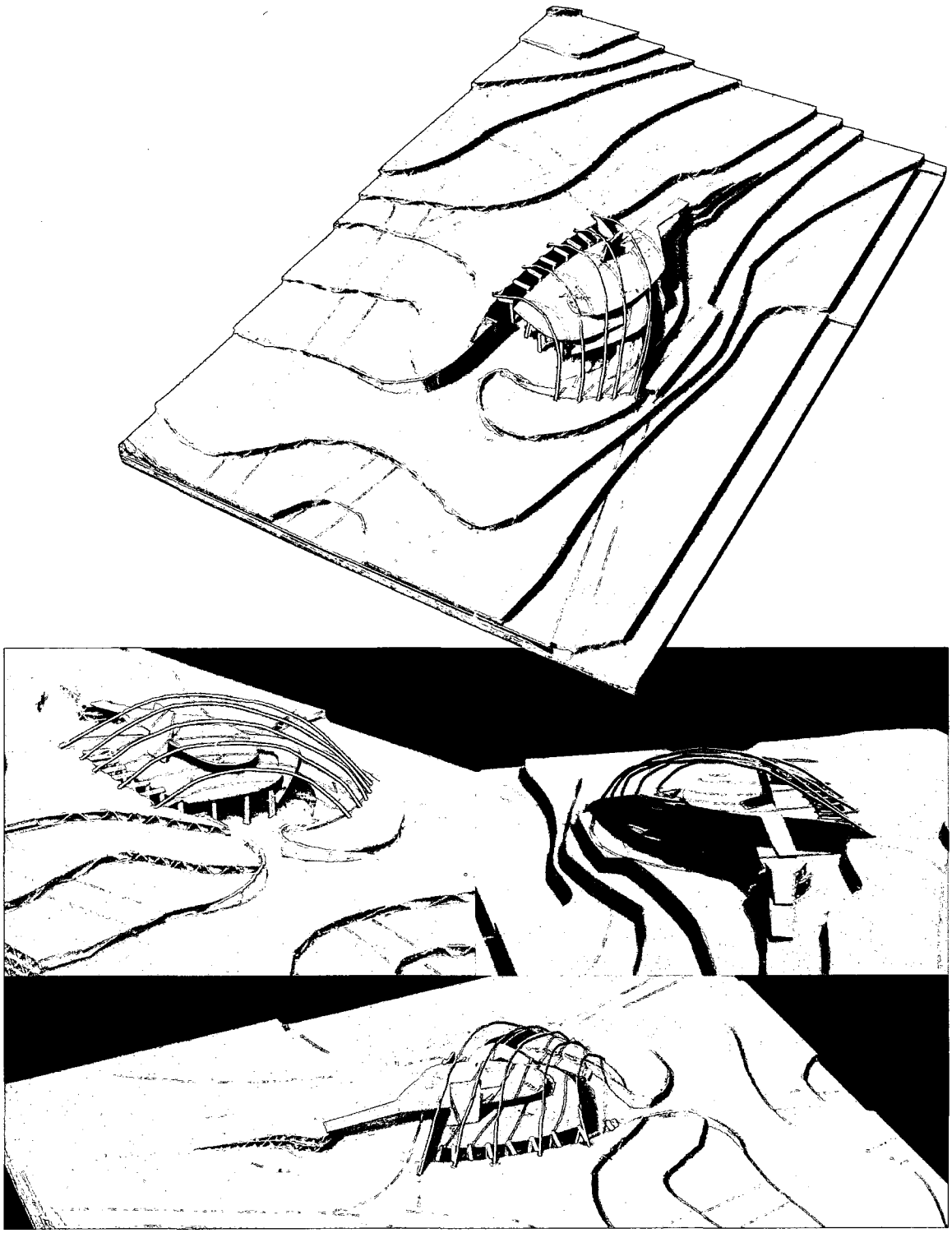
Program elements and sensory information are organized sectionally, informed by the characteristics of each route and prevailing directions of the circulatory patterns.



sectional program diagram

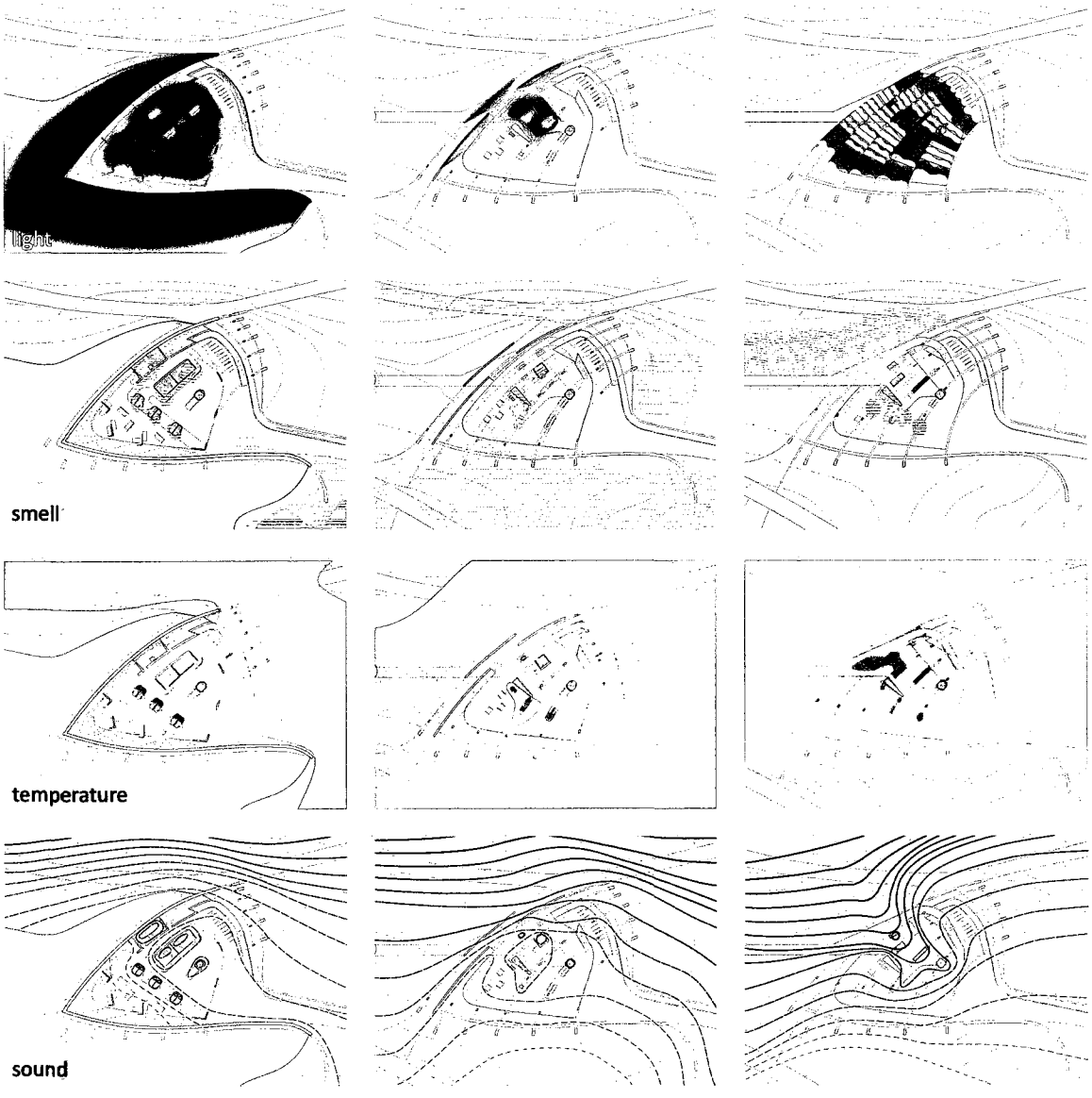
Process Model

The node's design was developed by focusing on the way the paths are pulled into the node and the dichotomy between light and heavy.

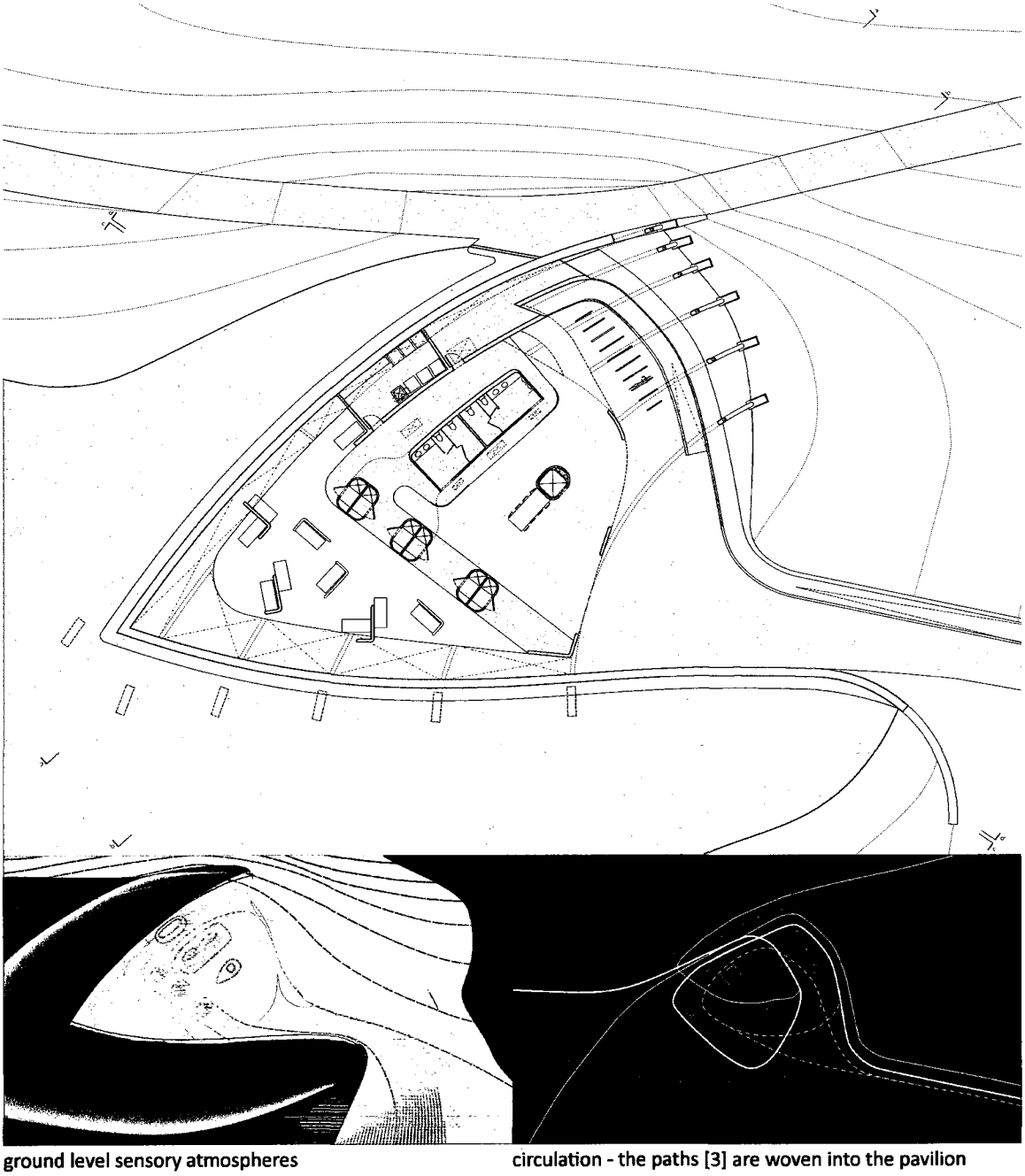


Sensory Maps

Each node is to be designed using a catalogue of programmatic sensory-specific elements (pages 27-30) that relate to the context of the path(s) and the definition of the node. These elements are deployed, enhancing and amplifying the site of the node to create a **matrix of sensory atmospheres.** Here, the environments are mapped/ programmed for each of the three levels of the node of focus.



Ground Level Floor Plan

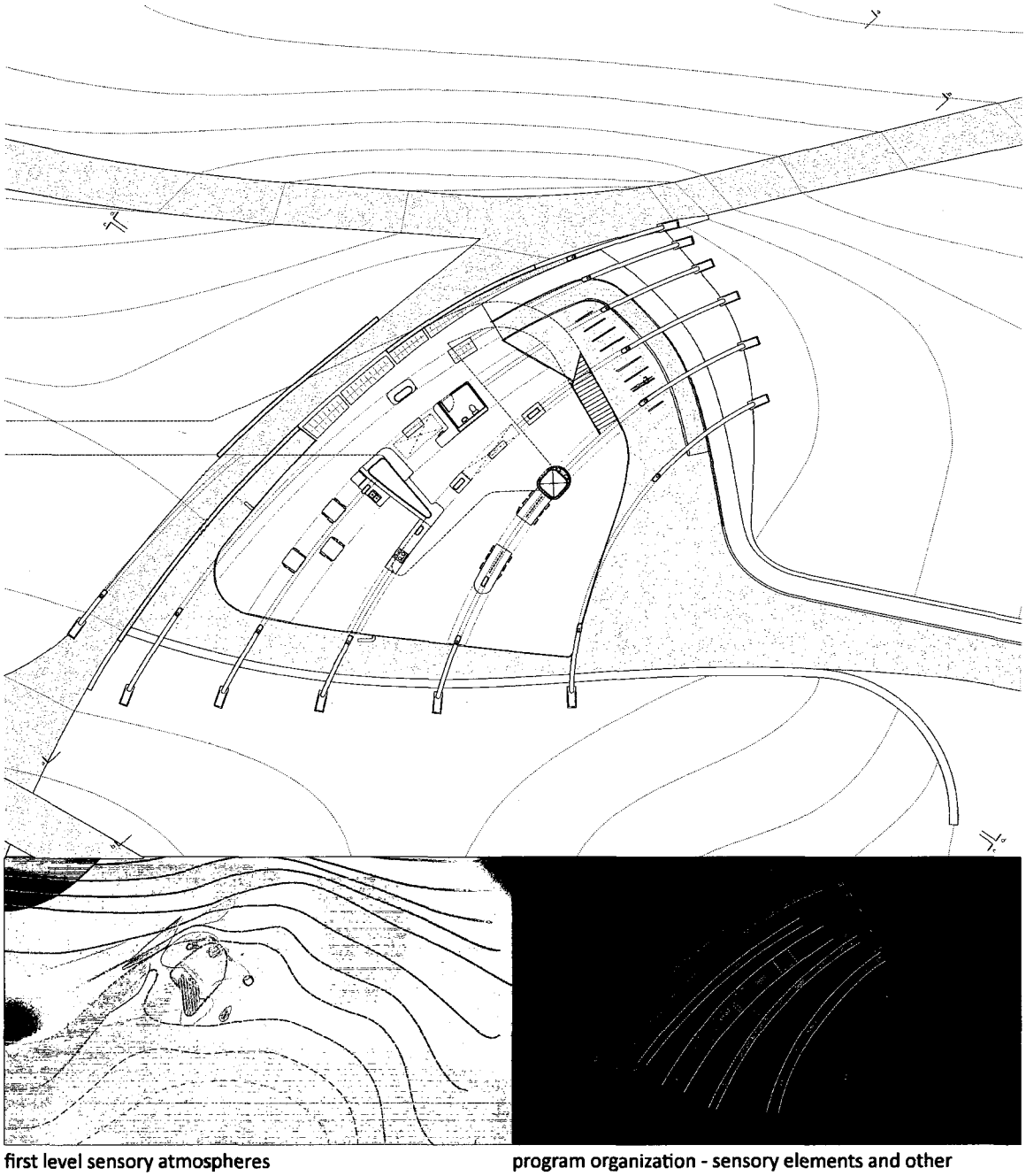


ground level sensory atmospheres

circulation - the paths [3] are woven into the pavilion forming continuous circulatory loops

The ground level is the most common entry point for long-distance hikers and cyclists. The quiet, muted space contains bunks, showers, rest rooms, laundry, and storage areas.

First Floor Plan

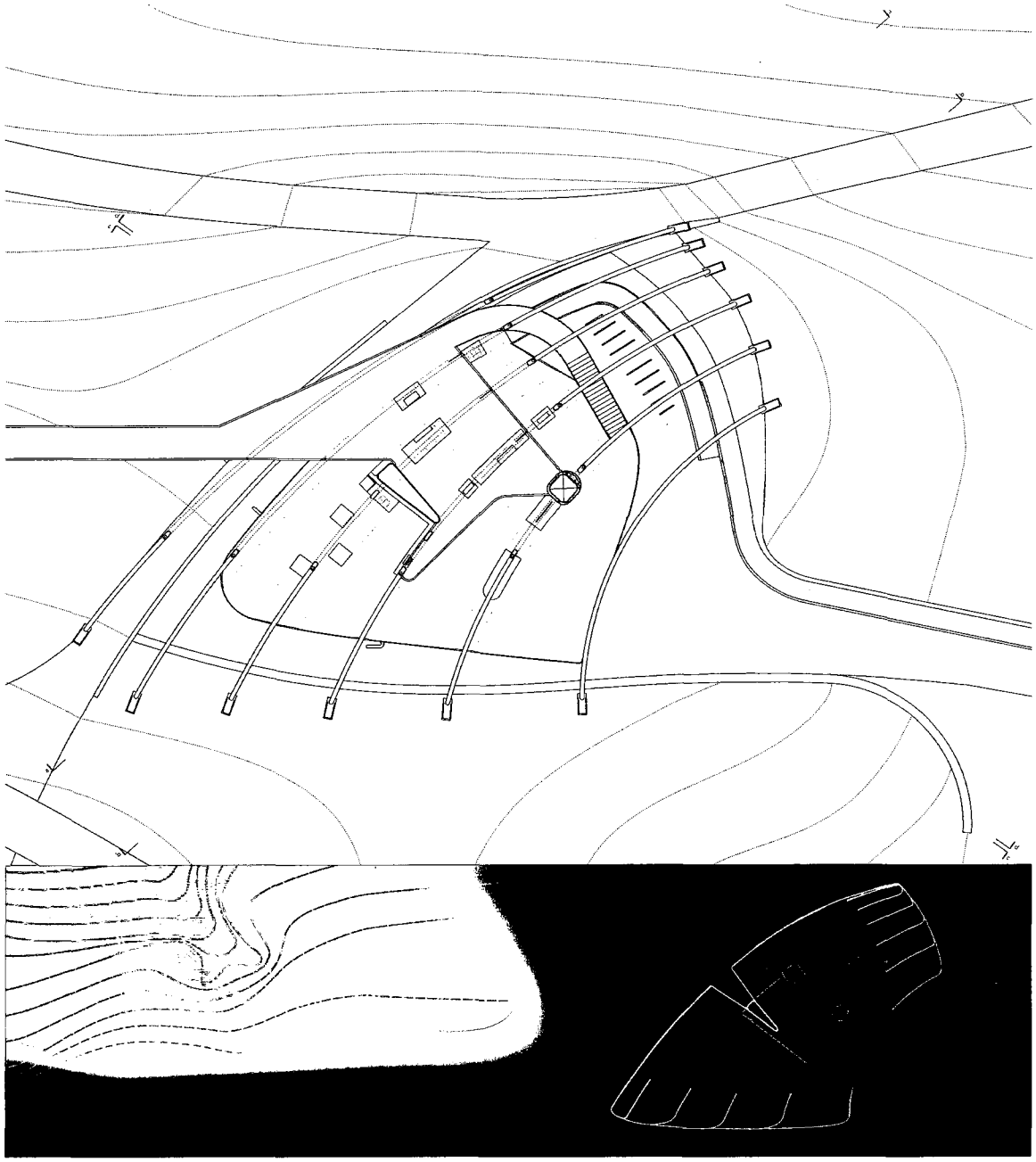


first level sensory atmospheres

program organization - sensory elements and other portions of the program are aligned with the structure forming recognizable bands

The first floor is the most convenient entrance for arboretum and neighborhood visitors. The light, open floor plan contains much of the more social program, such as dining, cooking, and information sharing.

Second Floor Plan

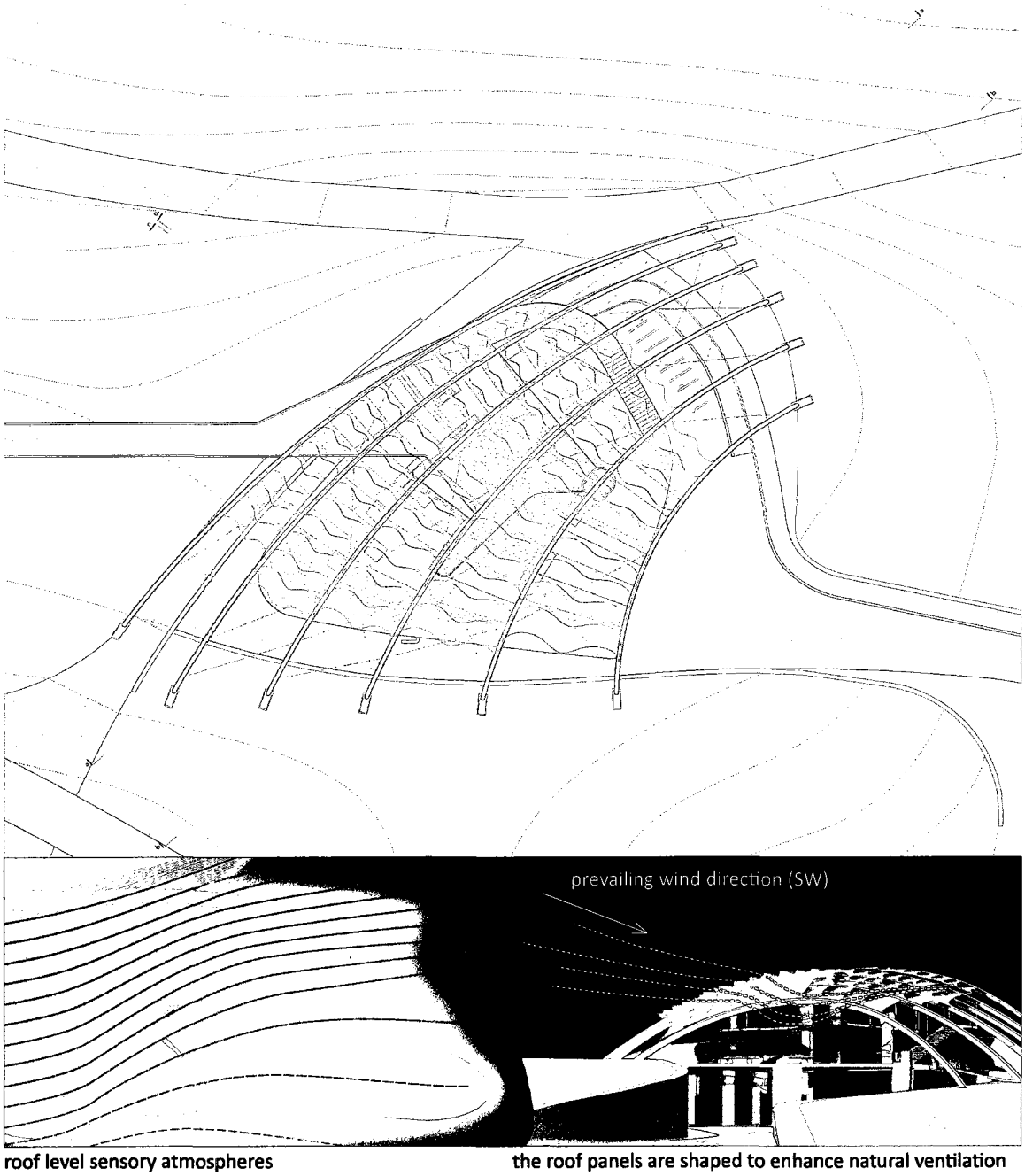


second level sensory atmospheres

water is collected from the roof and is held in a tank as a feature where it awaits use

The small second floor features a view towards the city and functions as an internal perch - overlooking all the activities of the node. Some information sharing program is also located here though it's a more individual experience than the level below.

Roof Plan



roof level sensory atmospheres

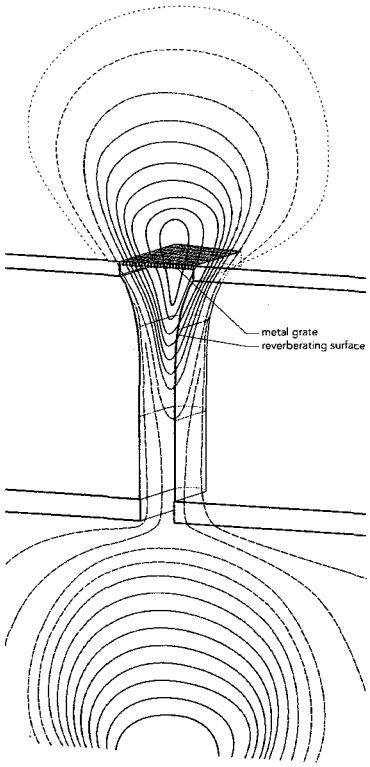
the roof panels are shaped to enhance natural ventilation

The roof system allows the 'MEP-filled pavilion' to function as such while still allowing for a fine grain of control over light levels.

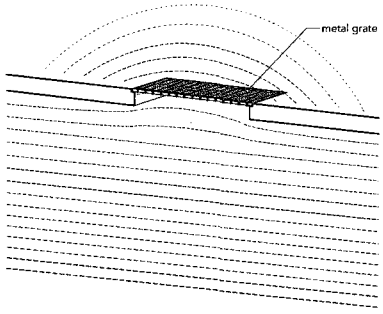
Sound Catalogue

Elements of the program are modified to take advantage of, or direct their sensory properties. These elements are then deployed to choreograph the sensory experience.

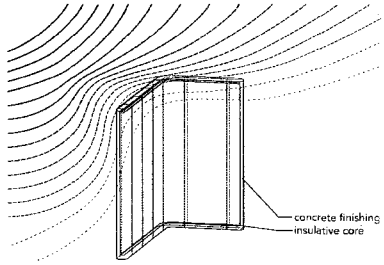
SMT_megaphone | laundry sound amplifier



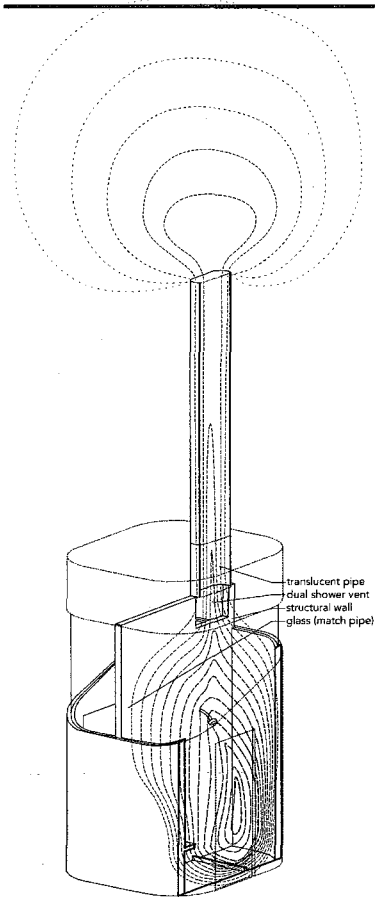
STML_void | metal grate



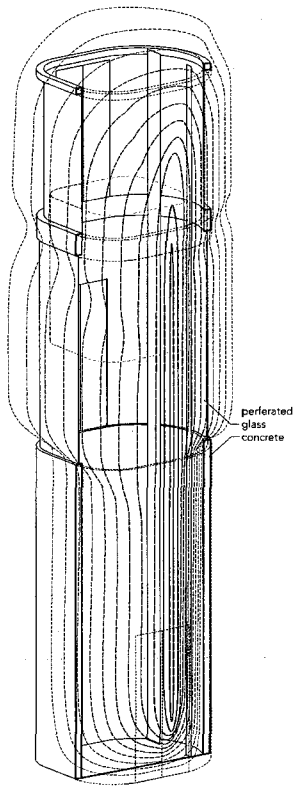
LS_screen | sleeping nook



TMS_exhaust pipe | shower unit



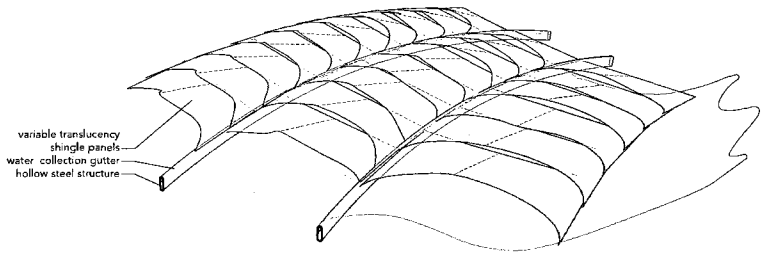
S_differentiated pipe | elevator



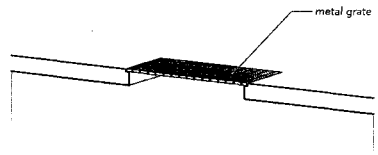
Temperature Catalogue

Many of the catalogue elements have multiple sensorial functions. The identifier (ex. TMS) for each element is ordered by what the primary, then secondary properties are (in TMS temperature is the primary quality, smell the secondary, and sound the tertiary).

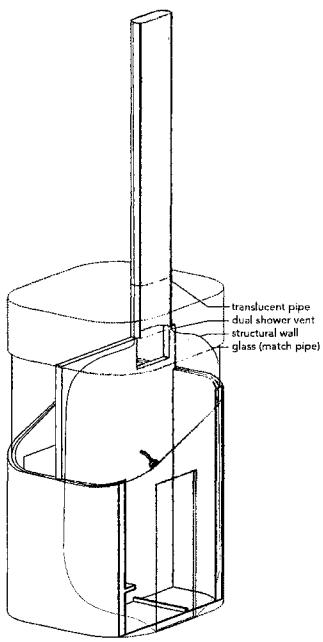
LT_airflow redirection | roof



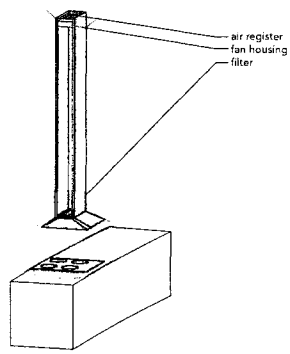
STML_void | metal grate



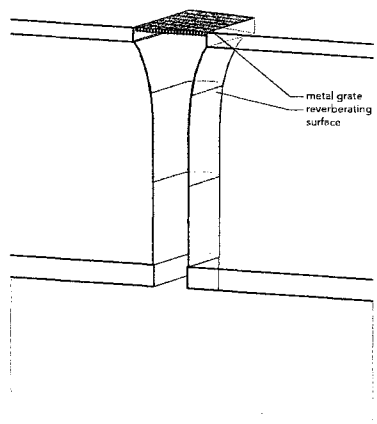
TMS_exhaust pipe | shower unit



MT_exhaust hood | kitchen range ventilation



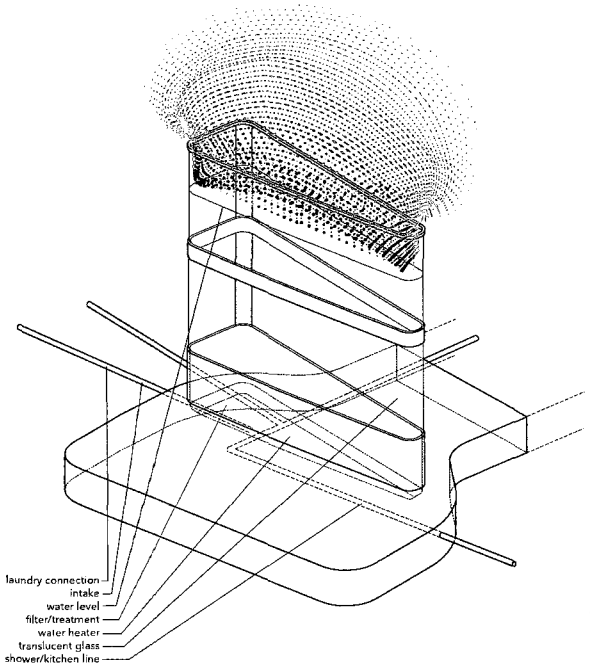
SMT_megaphone | laundry sound amplifier



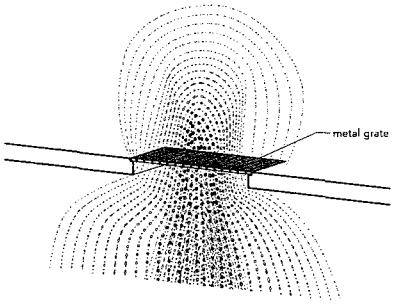
sMell Catalogue

The catalogue elements are keyed into the sensory matrix through their placement, materiality, and color so that the node can be easily 'read.'

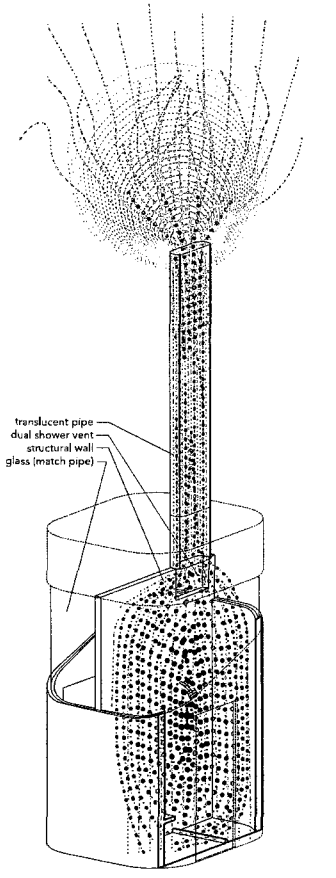
V_smell amplifier | water cistern



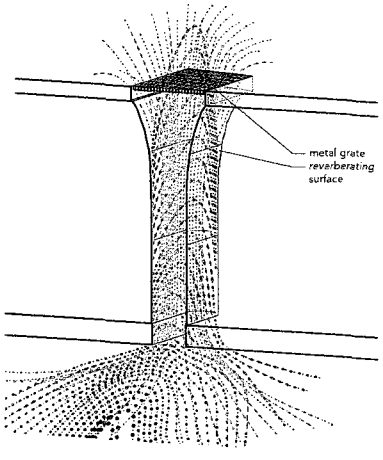
STML_void | metal grate



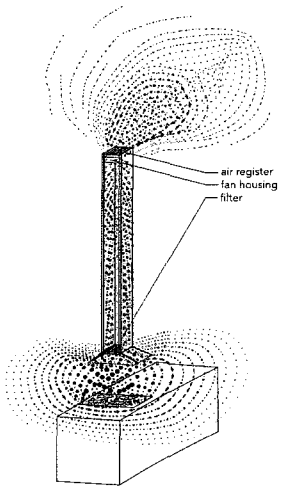
TMS_exhaust pipe | shower unit



SMT_megaphone | laundry sound amplifier



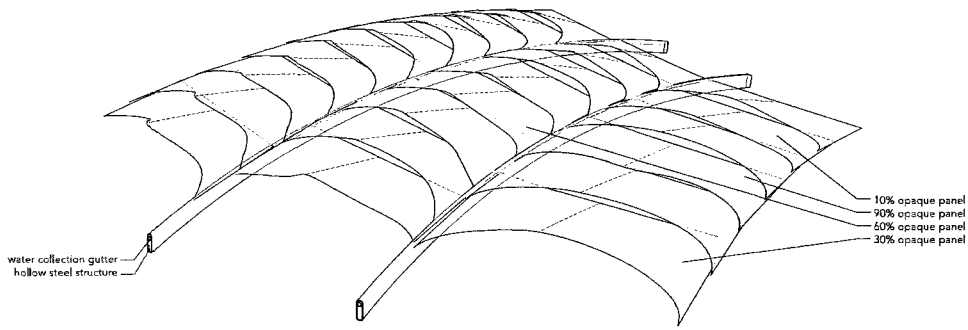
MT_exhaust hood | kitchen range ventilation



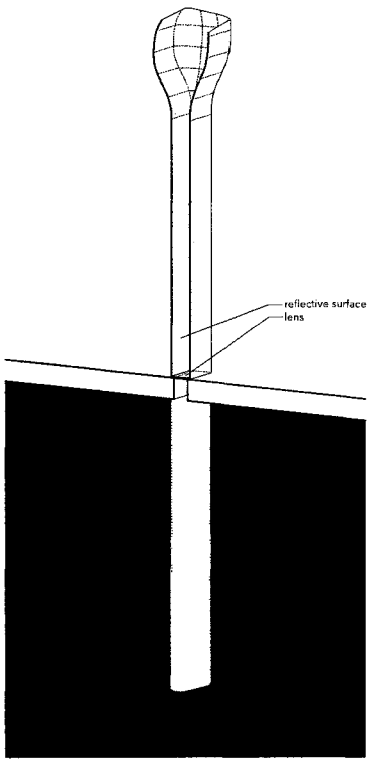
Light Catalogue

The pavilion [sensory matrix] functions as an 'architecture of the senses reader' - an amplified, collapsed version of the long-distance travelling sensorial experience.

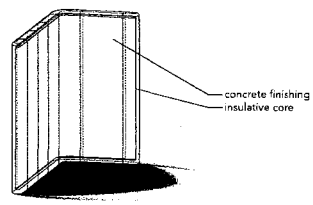
LT_translucency patchwork | roof



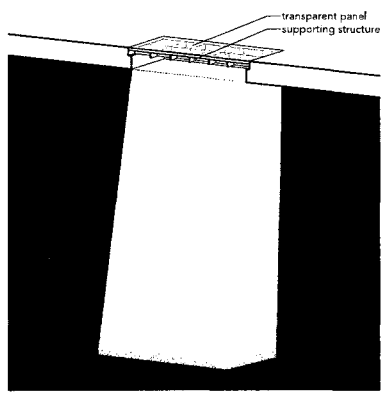
L_light tube | scoop with attachment



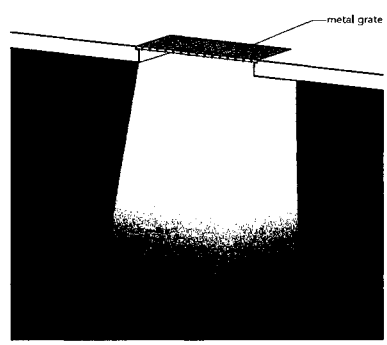
LS_screen | sleeping nook



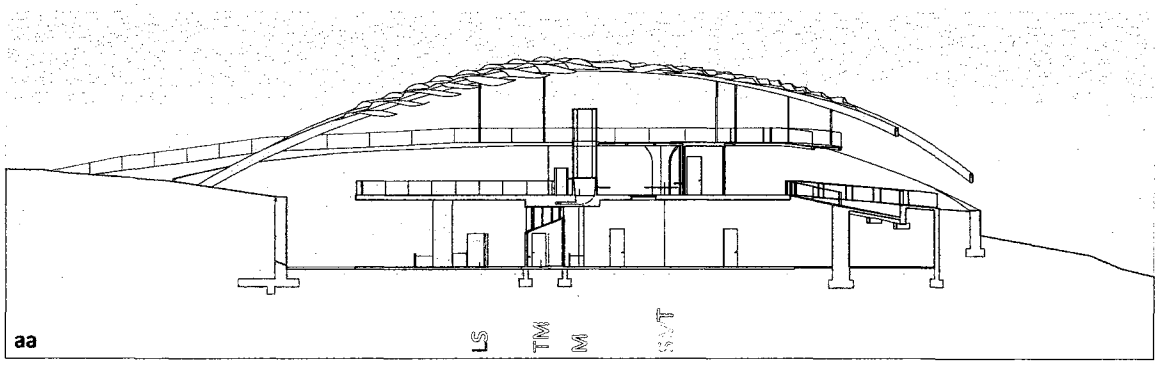
L_light void | transparent panel

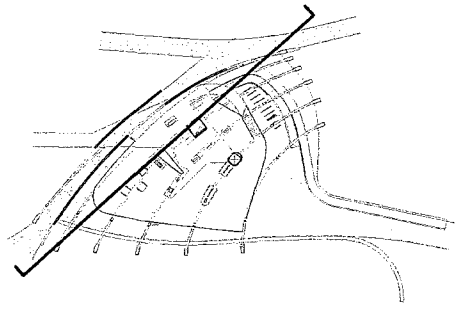


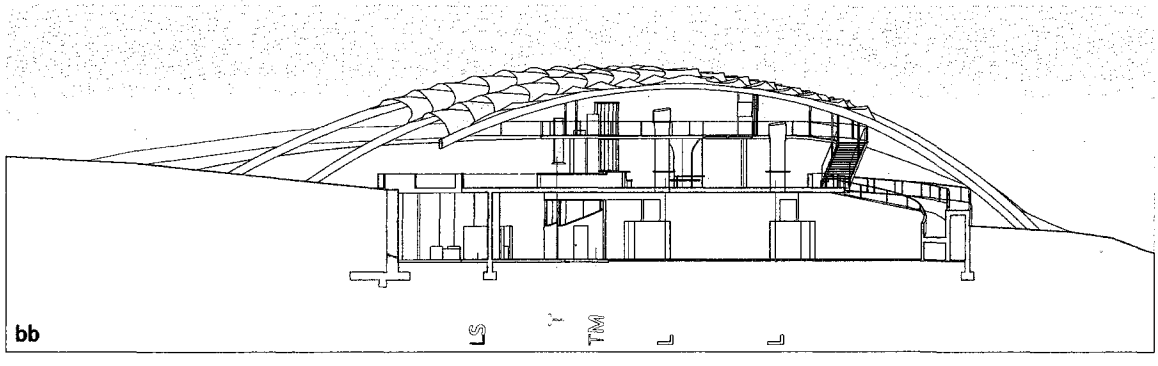
STML_void | metal grate

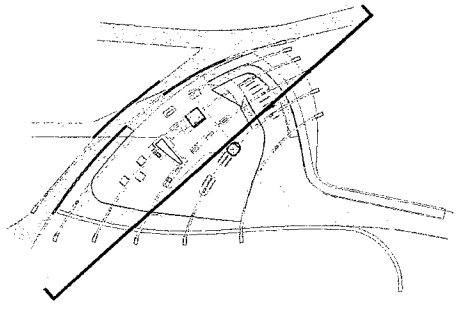


Sections AA and BB

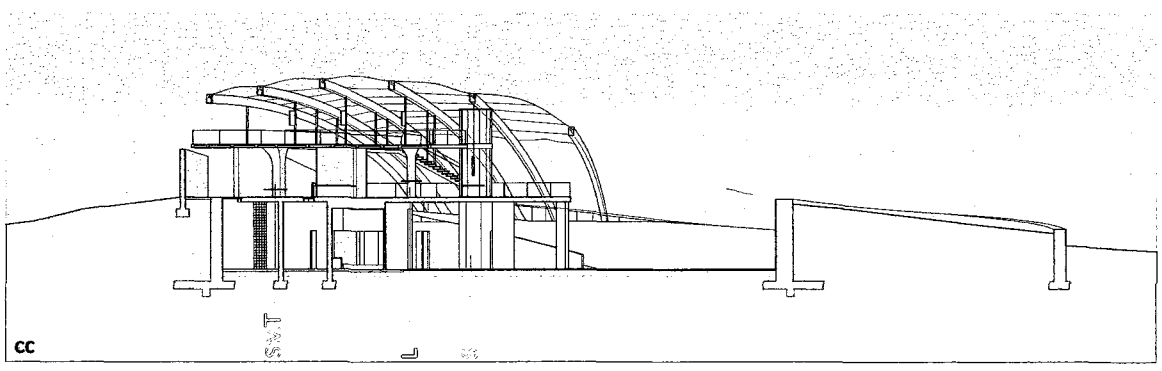


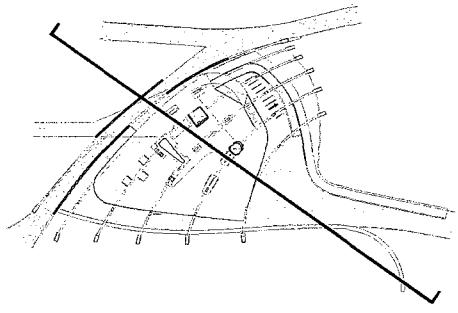


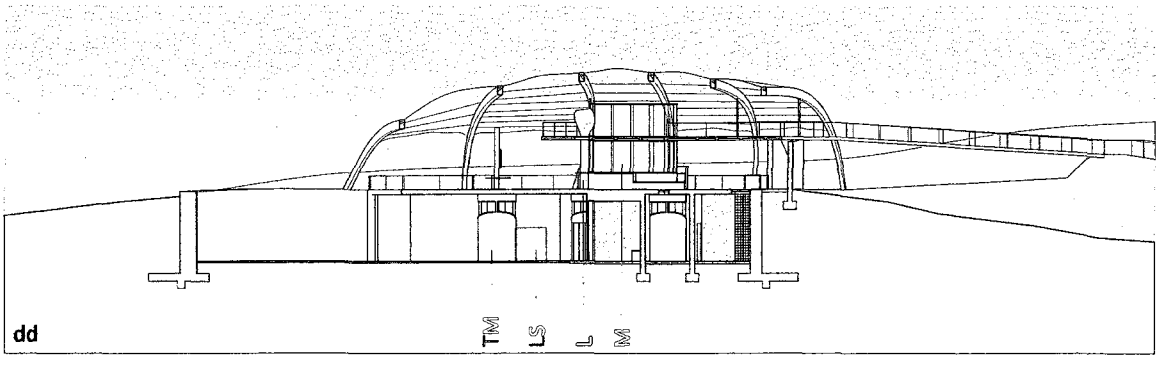


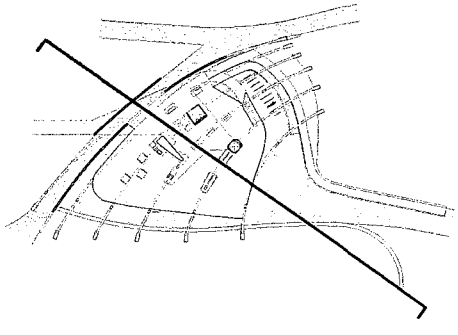


Sections CC and DD



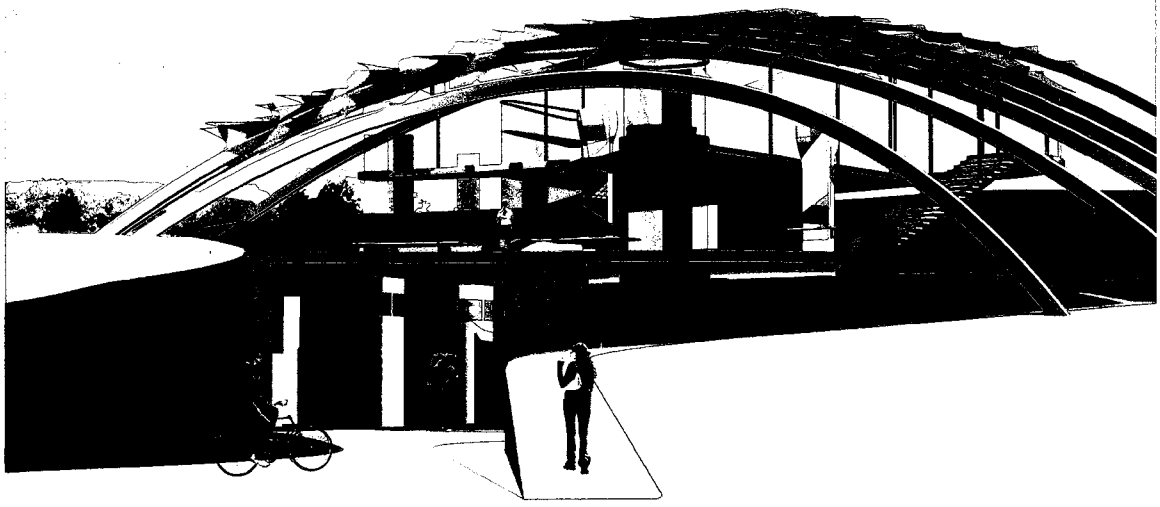


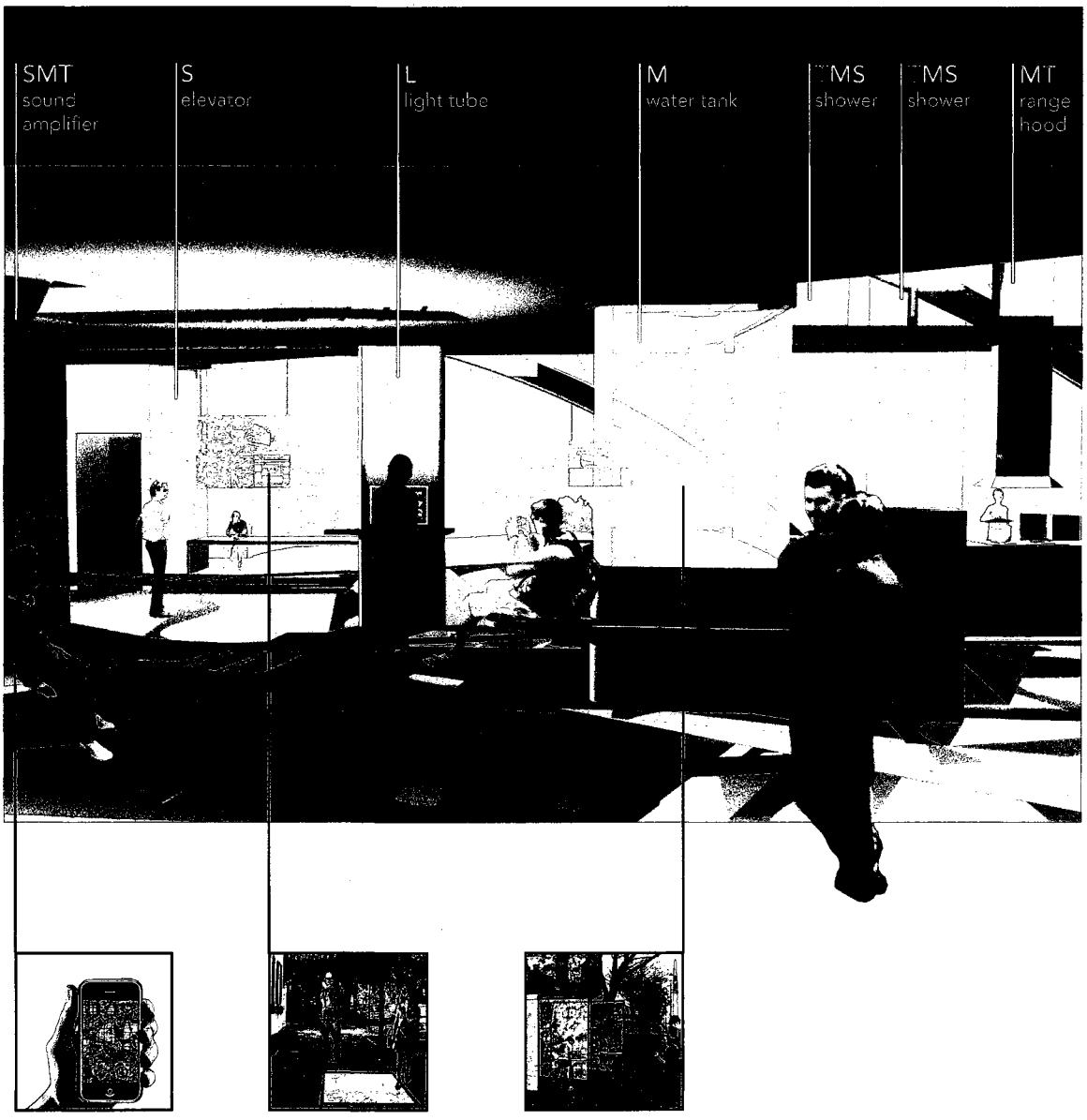




Final Rendering

From the east, the 'hiker' access has views into both the darker, more private, stereotomic ground level and the light, public upper levels.





Entrance Rendering - Prototype

This node is intended to be a **prototype** - one example of how to design a node containing the **cumulative program** [increasing with the scale of contrast] and by using the sensory **catalogue** combined with cues taken from the **site** and its **paths'** identities.

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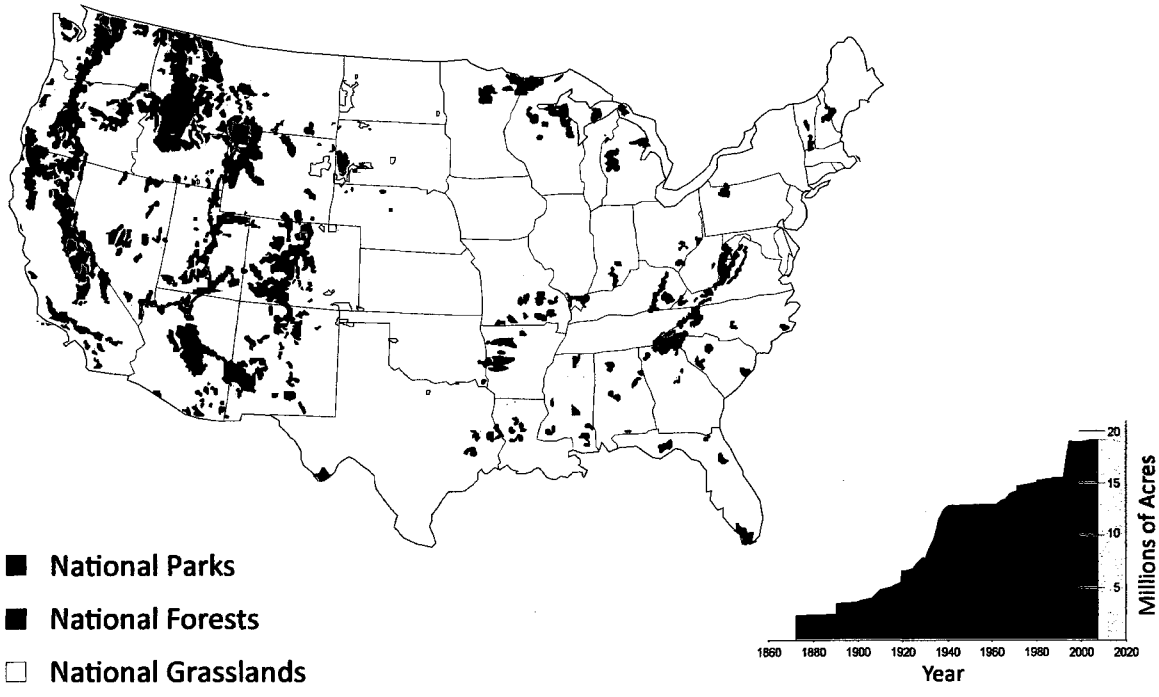
Appendix | National Parks (wilderness patch model)

Growth and Distribution

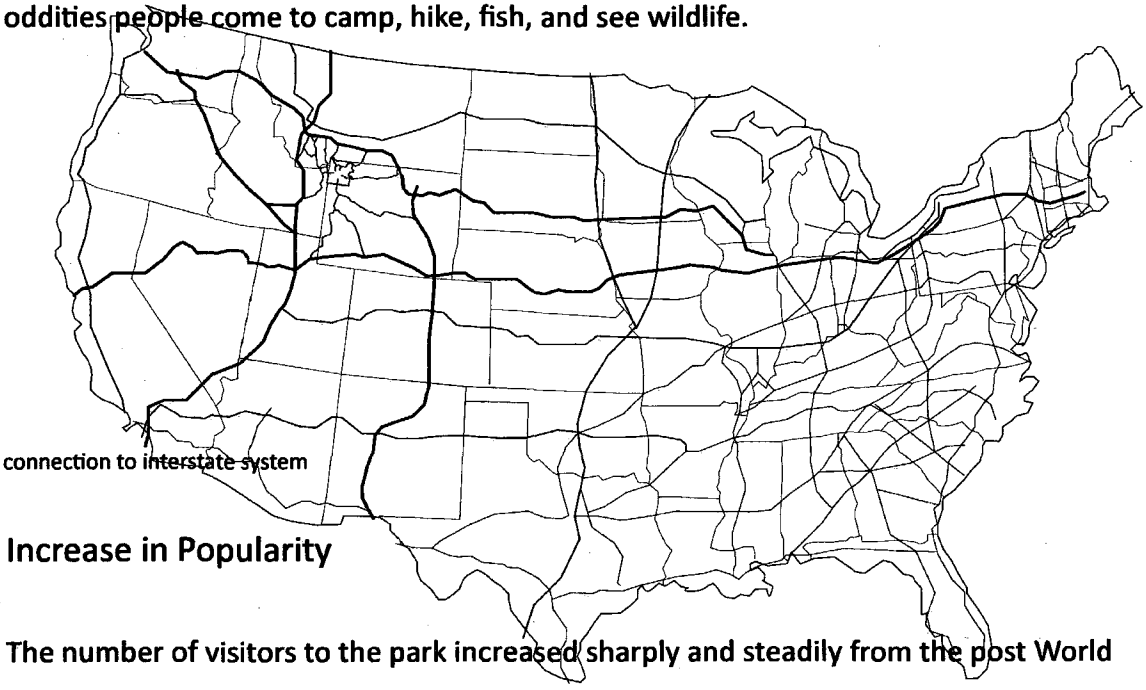
Yellowstone was designated as the first national park in 1872. Prior to that, other parks, such as Yosemite and Hot Springs, had been set aside to be protected for public use. The difference was that they were managed at a state level. Yellowstone became a federal issue because Wyoming was not yet a state. Since then a whole system of federally protected lands have developed, ranging from parks to national forests and grasslands.



Appendix | Case Study: Yellowstone National Park

History, Location, Size, and Guides

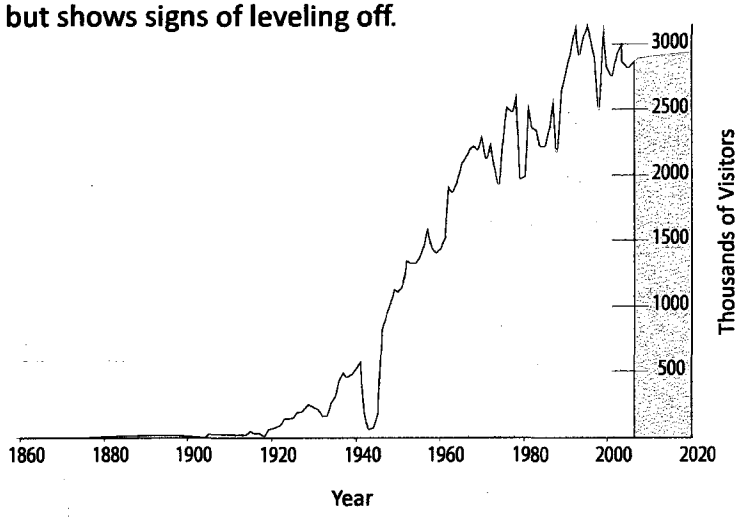
Yellowstone National Park, set aside as a national park on March 1, 1872, is located mostly in the U.S. state of Wyoming, though it also extends into Montana and Idaho. The park was the first of its kind, and is known for its wildlife and geothermal features, especially Old Faithful Geyser, one of the most popular areas in the park. Half of the world's geothermal features are in the 2,219,789 acre Yellowstone. These features include geysers, hot springs, mud pots, and fumarols. In addition to these scenic oddities people come to camp, hike, fish, and see wildlife.

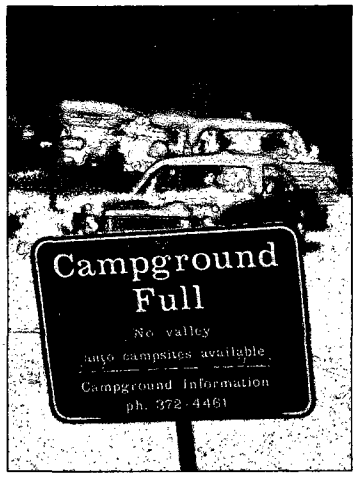


connection to interstate system

Increase in Popularity

The number of visitors to the park increased sharply and steadily from the post World War II years up until 1970. Since then, the number of visitors has continued to increase but shows signs of leveling off.

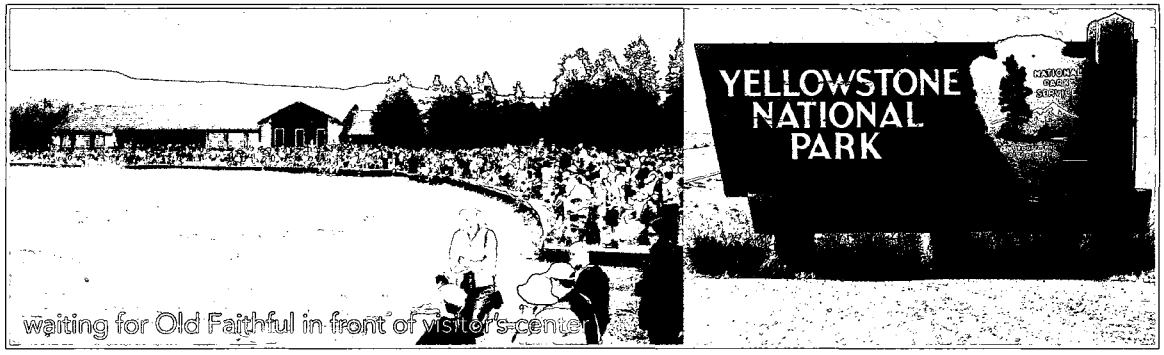




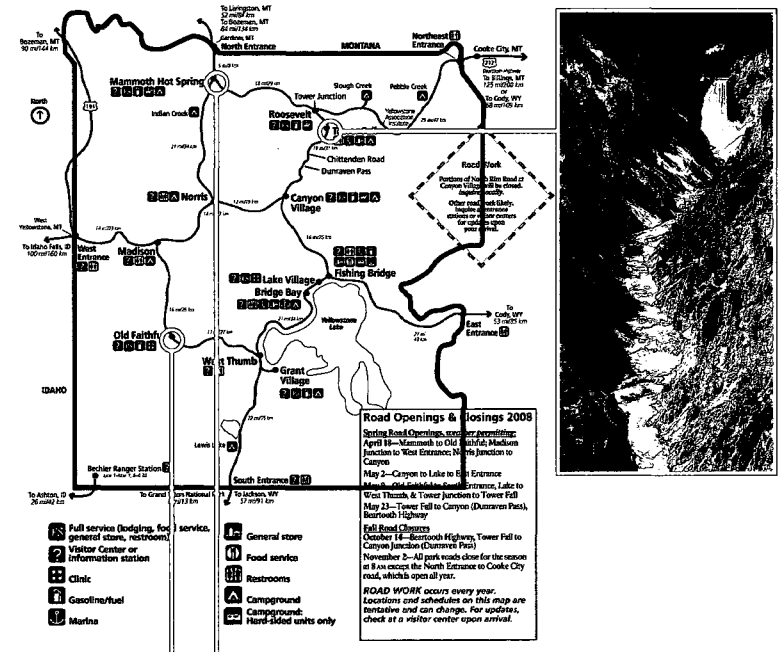
Appendix | Case Study: Yellowstone National Park

Infrastructure: Visitor Centers, Lodges, and Campgrounds

The National Park Service maintains 9 visitor centers and museums and is responsible for maintenance of historical structures and many of the other 2,000 buildings. These structures include National Historical Landmarks such as the Old Faithful Inn built in 1903–04. Camping is available at a dozen campgrounds with more than 2,000 campsites.



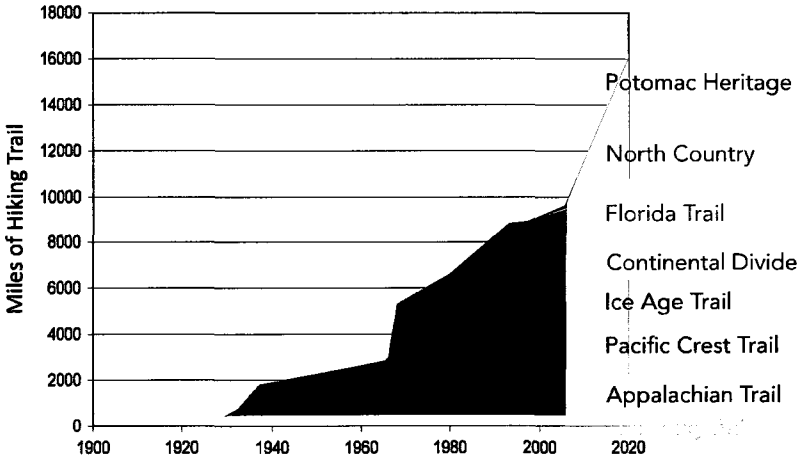
waiting for Old Faithful in front of visitor's center



park brochure map

Appendix | Trails (wilderness corridor model)

Development of National Scenic Hiking Trails



The Long Trail
constructed 1910-1930
272 miles
NY/VT border to Canada

Appalachian Trail
conceived in 1923
2,174 miles

Pacific Crest Trail
conceived in 1932, designated 1968, completed 1993
2,650 miles

Ice Age Trail
est. 1980, origins from 1958
1,200 miles planned,
600 complete
located in Wisconsin

Continental Divide Trail
as of 2004, 70% complete
3,100 miles
Mexico to Canada

Florida Trail
began in 1966
1,400 miles

Ice Age Trail
established 1980,
origins from 1958
1,200 miles planned,
600 currently complete
located in Wisconsin

North Country Trail
established 1980
4,600 miles planned
NY to ND

Potomac Heritage Trail
proposed 704 miles
connecting trails and historic sites in VA, MD, PA, and D.C.

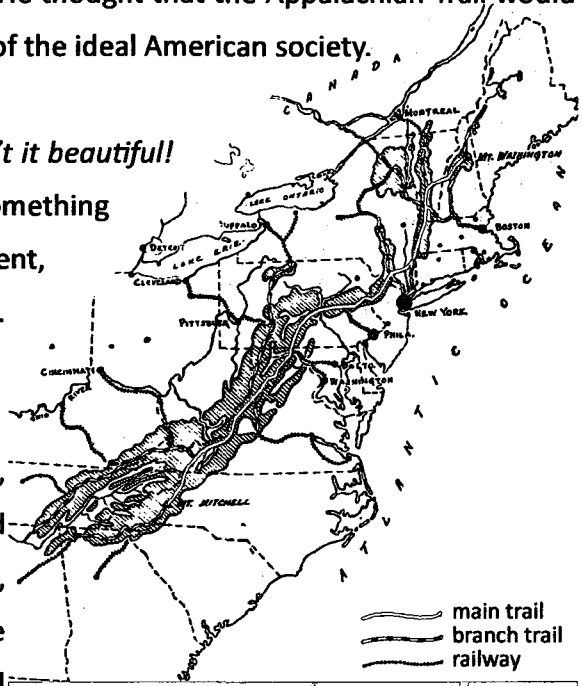
International Appalachian Trail
extends from AT into Canada

Appendix | Case Study: The Appalachian Trail

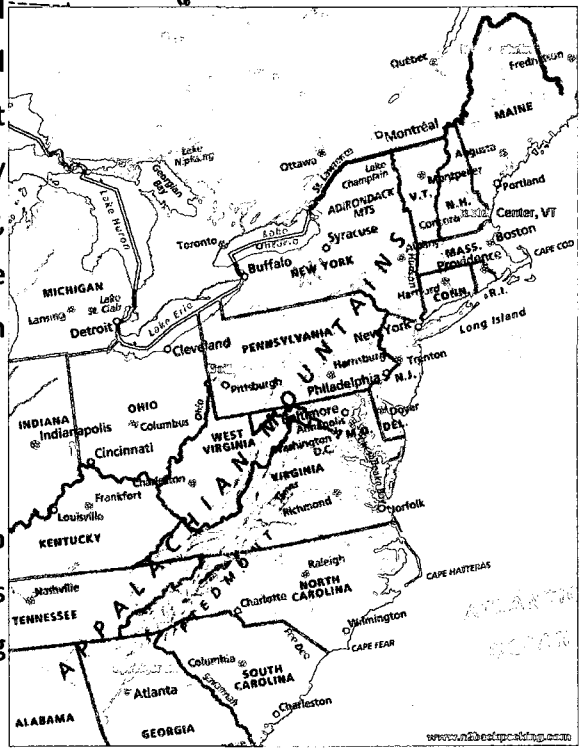
Benton MacKaye: The Origin of the Idea

In 1921, the Appalachian Trail was part of Benton MacKaye's plan for 'readjustment.' A "project combining a mountain trail and a series of recreational camps and communities" was more palatable than a "a frontal attack on the industrial system, involving construction of worker-owned industrial communities." He thought that the Appalachian Trail would provide an indirect route to his conception of the ideal American society.

"This is not to cut a path and then say- *Ain't it beautiful!* Our job is to open up a realm." The realm is something more than geographical – it is an environment, not of road and hotel, but of trail and camp. It is human access to the source of life.



While couched in socialist, utopian ideas, the Appalachian Trail was also planned as an **inverted transportation network**, meaning that the footpath formed the primary spine and railroads, highways, and other infrastructure branched off. The trail was not intended as a natural experience, it was integrated with a larger, revolutionary system. Original intentions aside, however, the idea of a wilderness experience was the most useful marketing tool, and the reason the idea was realized.



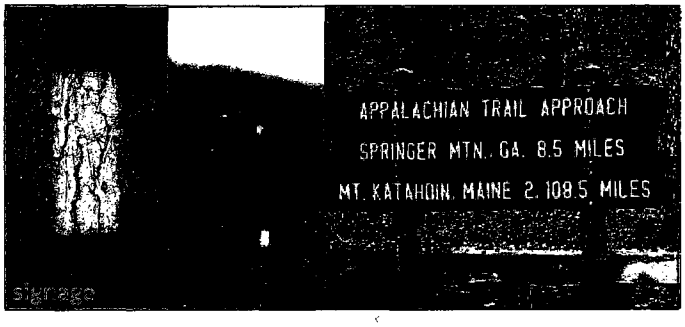
Size and Location

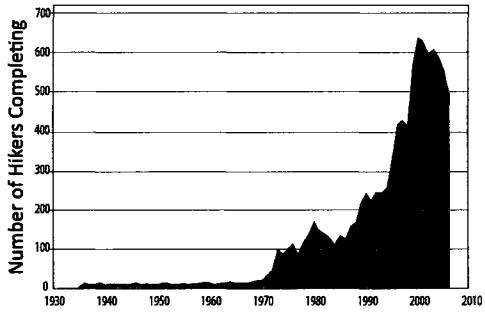
The Appalachian Trail is a footpath often no more than a couple feet wide that stretches approximately 2,174 miles connecting fourteen states.

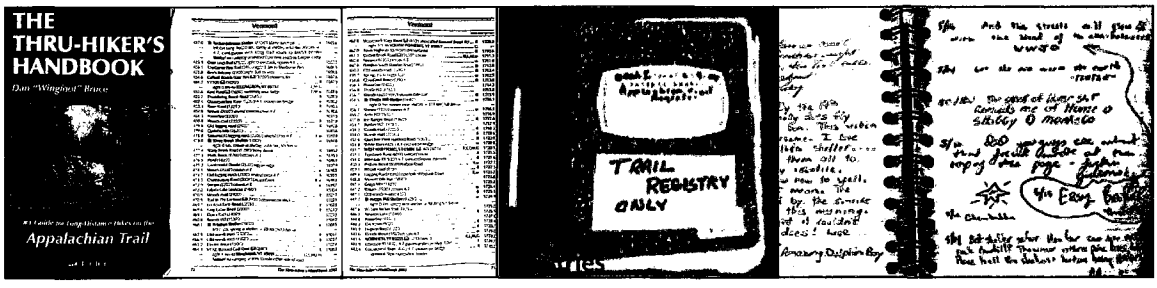
Appendix | Case Study: The Appalachian Trail

Infrastructure: Signage, Handbooks, and Registries

What physically makes the trail is a system of signage - two by six inch white rectangles painted on trees at consistent intervals called **white blazes**. Side trails which lead to views, water sources, shelters, and other points of interest are marked with a blue blaze. Other information such as distances to shelters, towns, or road crossings are occasionally called out on signs. Most hikers don't carry maps or compasses, instead they rely on the blazes and carry **guidebooks** that call out shelters, roads, water sources, and other points of interest, measured to the tenth of a mile. These guidebooks also call out what services are available in trail towns, post office hours, hostel prices, and other useful information in a brief, abbreviated format. **Trail registers**, which can be found in shelters, hostels, and important markers, allow for communication between hikers in addition to a sharing and solidifying of a common experience.





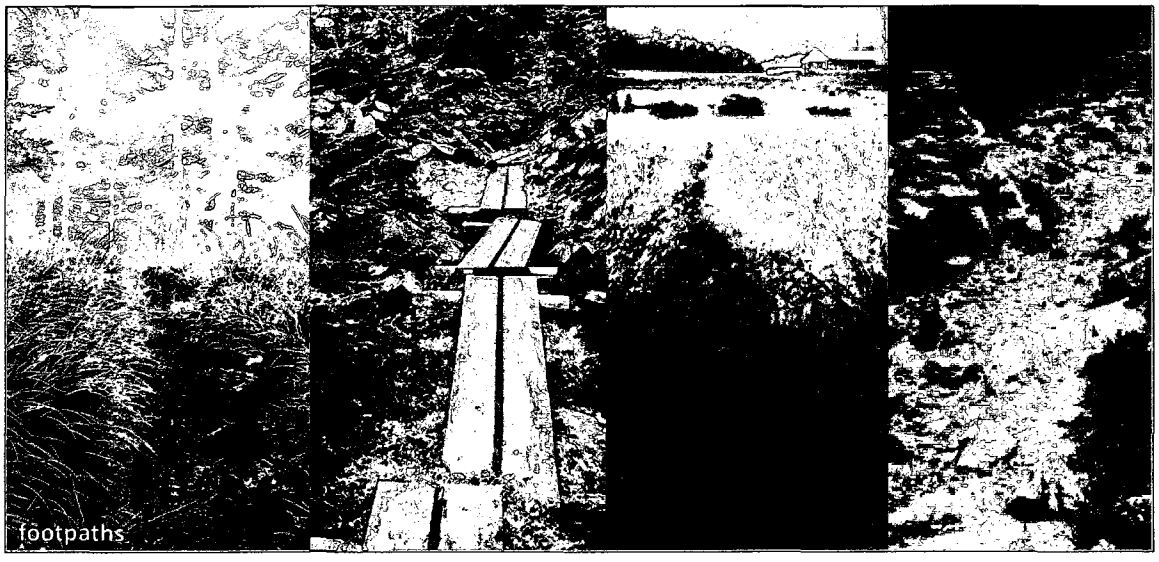


Popularity | The numbers of people who have successfully hiked the entire Appalachian Trail have been steadily increasing since the 1960s. This increase has puts strain on maintenance crews, shelters, camping sites, and the surrounding ecosystem. This is aggravated by the seasonal nature of thru-hiking which leads to crowds in Georgia in March and April for example. So far, despite the increase in numbers, most hikers still experience days of solitude.

Appendix | Case Study: The Appalachian Trail

Infrastructure: Shelters, Bridges, and Footpaths

Shelters and lean-tos are basic structures that most often consist of three walls, a roof, and a raised floor. They are ideally spaced a day's walk apart which leads to an average spacing of 10 miles though they can range from 4 to 20+ miles. These structures serve a variety of purposes; they can provide a place to stay where terrain would make traditional camping difficult (due to excessive rocks or flooding), they can alleviate the adverse effects of heavily used areas, or be necessary due to local wildlife.



Appendix | Comparison of Park and Trail Models

	Trails (corridor)	National Parks (patch)
Advantages	Trails tend to pass more closely by areas of greater population, connecting the experience to people's backyards. The long, linear structure serves to disperse users, to allow for an individual natural experience	Parks tend to be highly accessible, both in terms of getting there as they are well connected to interstate highways, and for handicapped or less physically-abled visitors The 'patch' model is necessary for wildlife habitat preservation
Disadvantages	The linearity of current examples leads to season surges of hikers who intend to hike from end to end (also leads to competition) Disconnectedness from larger scale transportation networks (roads, rail, ...) makes maintenance difficult and dependent on volunteer labor	Large vehicular crowds bring the congestion of the city to these 'natural' places Photo-op sightseeing leads to a very limited understanding of the park's environment or ecosystem further separating idea of natural park vs. home